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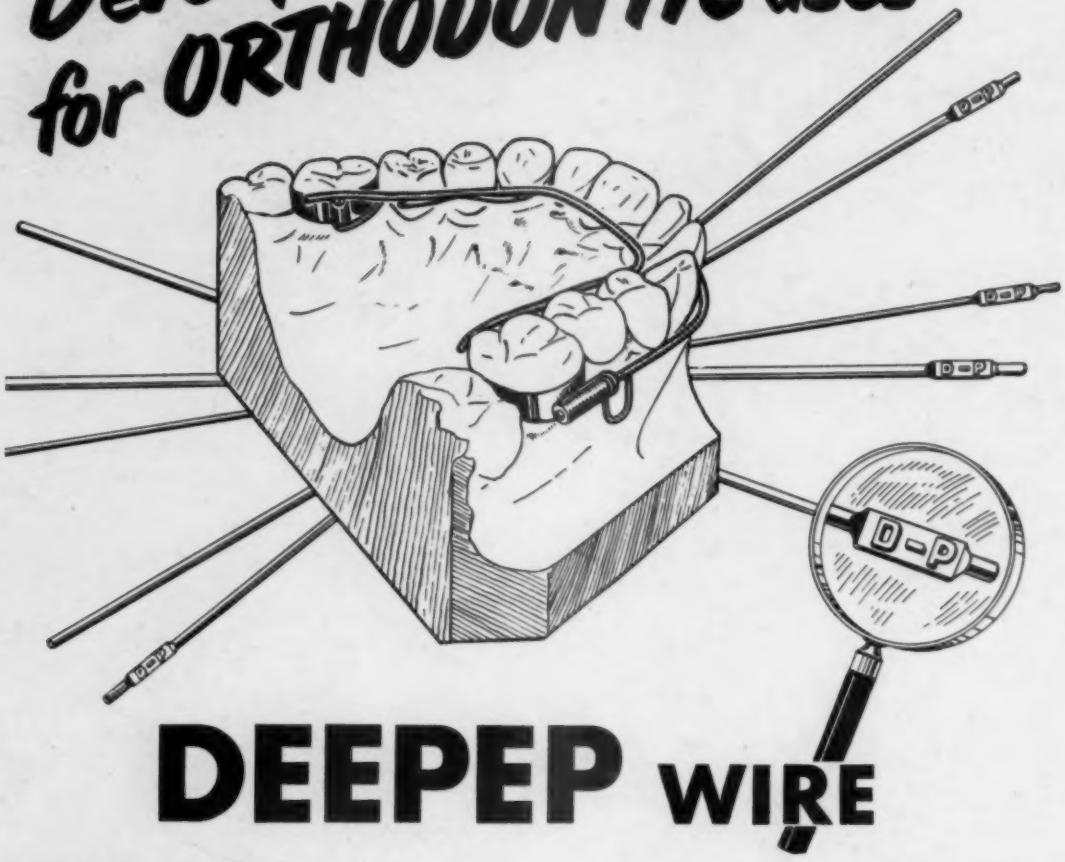

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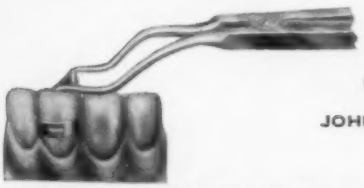
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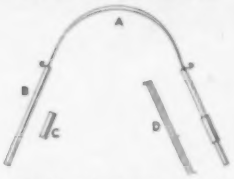

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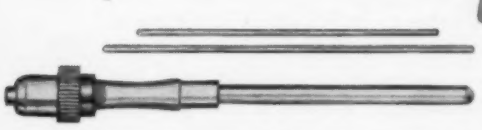
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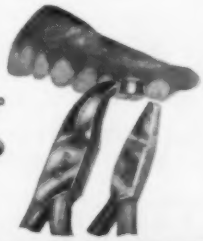

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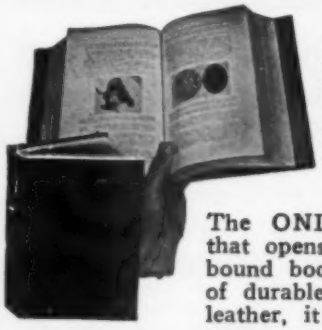

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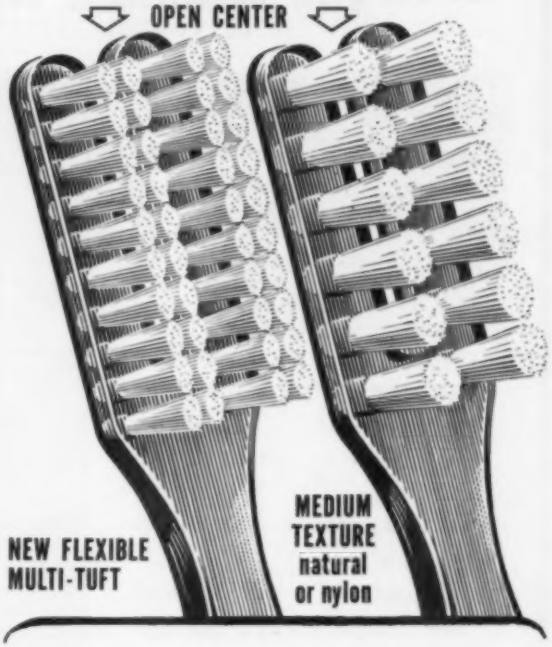

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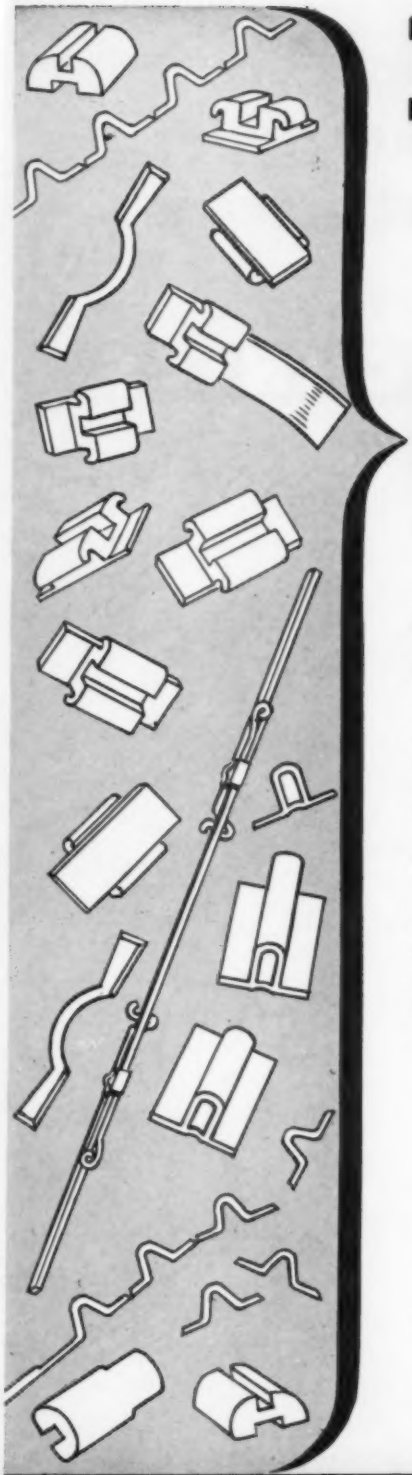

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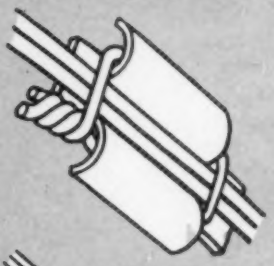

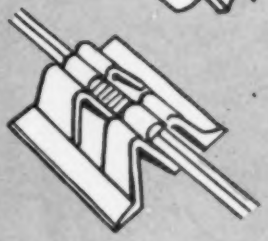

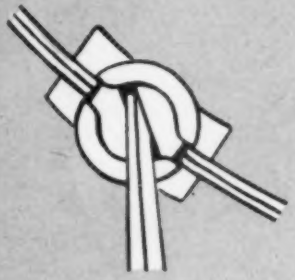

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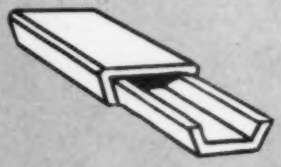

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VOL. 38 JULY, 1952 No. 7

Original Articles

ORTHODONTIC "GROWING PAINS"

ANDREW F. JACKSON, D.D.S., PHILADELPHIA, PA.

IT IS a matter of serious concern to all of those who have been engaged in the practice of orthodontics for any considerable length of time, and have built for themselves and the specialty good reputations on the solid basis of satisfactory clinical results, that the specialty is faced at the present time with some problems of vital importance to its future which require not only some very careful thought but also some prompt concerted energetic action to prevent much of this good opinion from being jeopardized by some ill-conceived ideas and educational methods which are not in harmony with the basic nature of these problems or the best interests of the profession.

Before engaging in any critical consideration or analysis of some things which are definitely very wrong with orthodontics at the present time, it is perhaps better and more constructive to study carefully what is definitely very right about orthodontics and about which we may all take some very justifiable pride. The purpose of this paper is not a morbid desire to find fault, but a sincere attempt to find a sane, logical solution to orthodontics' most immediate and pressing problems upon which we may hope to establish a sound sensible and truly scientific basis for future effort.

In order to appraise the present situation correctly it is necessary to go to the root of the *two main* basic problems about which there is a great deal of misunderstanding in the minds of the public at large, the profession itself, and above all others the deans of some institutions.

It is therefore not only necessary but imperative in the first place to have a broad comprehensive concept of the true nature of orthodontics, and in the second place an equally important appreciation not only of the qualifications which a successful orthodontist must innately possess, but also the requirements and basic conditions under which it is possible for these talents to be developed.

Presented before the Rocky Mountain Society of Orthodontists, partly ad lib.; subsequently consolidated and prepared for publication.

Orthodontics can never rise any higher than the level of the clinical results of those who are engaged in its practice. Fortunately, orthodontics' two fundamental problems are open to quite simple and yet profound analysis.

Orthodontics is looked upon by a large proportion of the profession in general as a rather controversial branch of dentistry associated with some complicated, and often not too successful, attempts at moving teeth by means of mechanical gadgets, some of them often of rather weird construction. A few abortive attempts at treatment by dentists themselves, without special knowledge or instruction, often result in such unfortunate failures that they not only leave any further attempts discreetly alone, but also are inclined to view the whole subject of orthodontics with rather unfavorable suspicion. At the time I myself decided to give up a good general practice of fifteen years' standing to specialize exclusively in orthodontics, several of my most intimate colleagues quite sincerely advised me to have my head examined!

The true fact of the matter is that orthodontics is so vastly more comprehensive in its actual nature than any of the other branches of the profession that to appreciate the scope of its problems together with its logical and obvious objectives, it must be looked upon from an entirely different viewpoint or concept from that of any of the other operative procedures connected with the practice of dentistry. The philosopher Spinoza has defined an "adequate idea" as "one which has grasped intuitively the whole nature of things and has seen and felt and refocused itself to this whole."

In its broad comprehensive aspect, orthodontic practice actually consists of bold and audacious attempts to alter the entire natural genetic and functional patterns of certain specific, unique, infinitely variable, scientifically incalculable and unpredictable human individuals. These changes include their teeth, bones, temporomandibular joints, and esthetic facial proportions. To be more specific, the factors involved include the whole gamut of heredity and environment, the infinite variations and combinations of anatomic proportions, physiologic functions, psychologic motivations and habits, diseases, endocrine unbalances, traumatic injuries, mutilations, and gross abnormalities. The resultant composite combinations which all these factors, with their infinite variations, are capable of producing must be appraised and balanced by the would-be orthodontist into single, all-inclusive, specific and individual mental pictures, and when judged "unsatisfactory," altered by natural and artificial means into other specific, unique, all-inclusive, three-dimensional arrangements which will remain in satisfactory and stable conditions of structural, functional, and esthetic equilibrium. This is orthodontics, and there is nothing in "the heavens above or the earth beneath or the waters under the earth" that can make it anything different or simpler. Brash has well defined it as the "experimental control of the experiments of nature." There is nothing in dentistry which includes a wider range of subject matter, greater variety of factors, or that requires more creative imagination and mental elasticity on the part of those who may hope to cope successfully with this fantastically complex combination of problems. The recent dental graduate is as qualified to deal clinically with these problems as the recent medical graduate is qualified to remove a cataract from an eye.

This may sound like an attempt to overexaggerate the complexities of orthodontics, or try to make a mountain of what superficially may often appear like a molehill. There is no denying the fact that some very necessary and beneficial orthodontic improvements are quite simple to understand and to perform and require very little special instruction, or anything more complicated than the exercise of a little common sense on the part of those who wish to perform them. On the other hand, every experienced orthodontist is painfully aware of the fact that many orthodontic conditions which appear simple enough at first glance turn out to be veritable hornets' nests the instant that any extraneous mechanical interferences are applied to disturb the delicate balance which nature has established. These consequences, in some cases, are appalling in the rapidity and extent to which changes for the worse may take place; changes which unfortunately in some cases, after the damage has been done, defy every orthodontic means to restore to even their original unsatisfactory state. There are cases which are packed with dynamite which only the most experienced can detect.

The fact that orthodontics in its broad sense includes so many basic sciences may convey the idea that every successful orthodontist should have a profound knowledge of all its component scientific subjects. This, fortunately, is true only to a very limited extent; otherwise the practice of orthodontics would be impossible. The successful practice of orthodontics is dependent on a totally different set of qualifications. The ability to swim has nothing to do with the depth of the water.

The cowboy sitting on an unbroken horse is dealing with just as many vital biologic problems in anatomy, physiology, psychologic motivations and habits, etc., as the orthodontist, but his success in the particular job he is engaged in does not depend on his even having a suspicion of what these abstract sciences are all about.

There is actually a strong basic biologic similarity, farfetched though it may seem, in the efforts of the cowboy and the orthodontist in that they are both engaged in dealing with all the complexities of these sciences, not abstractly or academically, but in the full glory and exercise of their dynamic functional activities in their most complicated form, and that the only test of their knowledge and competence in their respective fields consists in demonstration of their ability to cope successfully with their respective problems in bringing recalcitrant nature under human subjection.

It is transparently obvious, therefore, that those who have the temerity to engage in the practice of orthodontics should not only have a keen appreciation of these basic facts but also the time and opportunity personally and intimately to observe, study, and compare the methods and clinical results of those who have proved themselves clinical masters of this art. Furthermore, above everything else they should have the time and opportunity for sufficient personal practical experience to find out as a result of their *own* efforts whether they possess the peculiar personal qualifications to meet the exacting requirements which the successful practice of orthodontics demands. Not every man can become an artist in any field of endeavor by merely a desire to be one.

The most complicated activities of life are all of this nature; that is the reason we pay good money to go to theaters, ball fields, and art museums to see tangible expressions of genius at work—the most highly developed functional activities of which the human mind and body are capable.

It is precisely due to the widespread misunderstanding which is prevalent among the mass of those who are not familiar with the true nature of orthodontics and its requirements that the necessity for higher scientific education appears so imperative as the predominant, if not the only avenue of solution to some of the present very obvious orthodontic problems.

The fact that a very fine brand of orthodontics is being consistently practiced by a substantial group of distinguished orthodontists and is held in very high regard by the public at large is definite proof that it is not lack of scientific knowledge which is responsible for many of the clincal failures which are at present unfortunately all too prevalent. It is the lack of clinical judgment in knowing how to make use of the knowledge which we already possess which is the real reason for the present situation.

This is not an excuse for scientific laziness or any criticism of the scientific method as applied to orthodontics, but rather to direct attention to the inadequacy of science per se to cope with clinical problems and the categoric necessity for the exercise of those far more subtle faculties of mind and innate skills which are beyond the range of precise scientific expression.

In view of our totally inadequate scientific knowledge to deal with any exactitude with the fantastically complex combinations of factors which enter into each individual orthodontic case, there is therefore left only one predominantly effective means of dealing with orthodontic problems fom their vital clinical aspect. Much as we would like to reduce these to an exact science, there is nothing more thoroughly unscientific in the world than decisions which are based on incomplete, one-sided opinionated viewpoints which do not include *all* the factors involved in a problem.

One of the main glories of true science lies in the simplicity with which one pinprick of actual obvious demonstrable fact can puncture the most plausible but fallacious academic theories or projects however alluring or convincing they may appear to be superficially. As applied to the practice of orthodontics, for instance, the fact that individuals with the same parents and environments may inherit and develop, quite in accordance with the laws of genetics, totally different sizes, forms, and proportions of teeth and bony structures renders practically useless clinically the most intensive anthropological studies or elaborate formulations based on statistical data when these are used to make diagnostic decisions regarding the individual treatment of a specific case or the chronological time most desirable to initiate it. This is *not* a criticism of physical anthropology as a cultural background for orthodontics.

The most thorough scientific knowledge of dental histology and periodontology likewise is totally useless to its possessor when this knowledge is disregarded in order to employ the use of ill-conceived and misapplied mechanical appliances.

Every vital problem in life must, in all logic and common sense, be dealt with with the three methods of approach at man's command: the philosophical, the scientific, and the artistic. They all have their proper places in every problem in life but the measure of success which may be hoped for will depend on the degree of intelligent application with which each is employed.

It is easy for those lacking in artistic feeling to criticize superciliously the earnest and sincere efforts of those who, far superior to them in their innate intelligence and sensibilities, try to express in simple words the working subtleties of that very superior yet undefinable faculty of the human mind essential to the practice of a fine art.

There is nothing vague or abstract about art. It is the simplest and most direct method of dealing with complicated problems there is in the world.

The essential requirements of the artistic approach are just as definite and logical as those of the scientific approach and there is nothing difficult to understand about them. All forms of practical art are so fantastically complex that their most subtle nuances can never be reduced to words or set formulas but can only be initially acquired by the very simple process of imitation and practice and carried to varying degrees of individual efficiency by the innate intelligence, creative imagination, intuitive perception, and long and unflagging efforts of those who innately possess and are truly interested in developing these qualities in themselves. The acid test of an artist is the breadth of concept and the simplicity and directness with which he can attain his practical objectives.

In orthodontics, as in every other form of art, the first and most important essential for the beginner is, therefore, to have teachers worthy of initial imitation whose experience and practical demonstrated results are amenable to intelligent analysis and acceptance. The real artist, the man who is eventually going to make a good orthodontist, should, however, not follow or imitate anybody, however impressive his results may be, beyond a certain point, that point depending entirely upon the pupil's own independence of thought and the degree with which this may happen to coincide with that of his initial instructor. There are few thrills in life comparable to the feeling of satisfaction derived from the sense of development and growth of the human creative faculty. The true teacher of any form of art should recognize originality and the desire to think for himself, as the most valuable and indispensable asset in the development of any true artist, and particularly so of an orthodontist. Far from feeling any offense at any independence of thought in his pupil, these signs should be looked upon as those of a fledgling trying to use his own wings.

Can anyone teach any form of art who does not know how to do what he himself is trying to teach?

In the light of some present rather unfortunate orthodontic conditions, there is nothing the least bit funny about the old adage that those who know how—do, and those who don't—teach. Any allusion to this facetious statement does not in the slightest degree refer to, or include, those who are engaged in teaching subjects of a purely scientific nature or individuals who have shown marked executive ability, but its importance cannot be overemphasized when

applied to those who have been elected to teach any of the branches of operative dentistry which include any form of clinical treatment and in which that subtle but all-pervading quality of "clinical judgment" is the determining factor as to a man's fitness as a teacher. The true teacher of any of the forms of the art of dentistry will never let his intellectual integrity overstep the boundaries of his own proved clinical experience and this should be broad and comprehensive. This is the pivotal issue at stake in orthodontics today.

Taking into account the essential qualities of creative imagination, inventive ingenuity, and even intuitive perception which are necessary to span the gaps which science is unable to fill, together with the manual skills which are essential for successful practice, it is quite natural that many men enter the field who are innately woefully lacking in these essential qualifications and turn to the teaching profession both for a livelihood and to bolster their waning reputations by connections with institutions of learning. The teaching field is naturally besieged by individuals of this type who in many cases are very clever in creating outward impressions of their qualifications as teachers. It is actually very easy to do this by writing papers on any of the highly scientific aspects of the orthodontic problem but which have little practical application. Individuals of this type would welcome nothing better than to win for themselves positions of "full-time professorships" which would provide sinecures for their financial needs in lieu of their precarious private practices and at the same time establish them in the professional esteems which they so urgently desire. If it were mandatory for all essayists who are engaged in the active practice of orthodontics, either as private practitioners or clinical teachers, to present some concrete clinical evidence of the practical usefulness of their presentations, much valuable time would be saved and put to better use at orthodontic meetings, and truer estimates established of these individuals' actual orthodontic knowledge.

Two years ago, under the title of "Orthodontics and Orthodontists," I wrote an article which I thought was forceful enough on this subject. The wide response which I have had to this article, both written and verbal and both from this country and abroad, is evidence that there is a widespread and intense dissatisfaction among the alumni of many of the universities about the way in which many of the orthodontic departments are being managed, particularly in the matter of personnel.

As the purpose of this article is fundamentally constructive and there fortunately are in the country orthodontic departments which are being conducted with logic and common sense, it is evident that some basic conclusions regarding satisfactory working conditions may be gathered from studies of those departments which are being conducted with the general approval of the profession.

In order to diagnose and evaluate intelligently this present unfortunate condition of orthodontic affairs, it is necessary to view it from the perspective of its comparatively short history. As there are in the profession men who have every qualification that a good orthodontist should possess, it is very en-

lightening to review briefly the basic pattern by which these present familiar figures acquired their real orthodontic education by comparison with some of the unfortunate educational methods which are being practiced at this time.

No consideration of the present status of orthodontics could, therefore, be complete without due regard for what Angle did for the specialty both to its enormous benefit and also its detriment.

To the force of his personality must everlasting credit be given for establishing orthodontics on a sound basis as an organized specialty. He did this by a combination of two factors. He carefully selected in groups of classes some of the keenest minds and outstanding personalities in the general practice of dentistry of his time. He then proceeded to indoctrinate them with a hard-bound system of diagnosis and mechanical therapy of his own invention.

By doing this he brought together the first large groups of intelligent, serious thinkers, who by their concerted efforts, interchange of ideas, and the development of their individual clinical skills established the solid foundation for what has been accomplished in orthodontics to date.

Perhaps it was necessary as an initial step in the organization of orthodontics as a specialty to have a definite, rigid plan of procedure and a despotic and uncompromising dictator to enforce it. For the time being it was perhaps better than the confusion which preceded it.

As a pioneer, Angle may possibly be forgiven for the fact that his whole concept of orthodontics and his methods of dealing with its basic problems were based on a very obvious but devastatingly fatal fallacy. This fallacy is the absolute impossibility of harnessing infinite variation as found in anything as fantastically complex as orthodontics to a definite set schematic classification and "system" of mechanical therapy which in its broad sense is out of harmony with many of the basic biological principles of nature.

I discussed recently the fallacy of one of the well-known clinical "systems" with a prominent anatomist who admitted its fictional basis freely but as a typical college professor vigorously defended this dogmatic method of instruction to the undergraduates on the ground that they at least had to be given something definite and concrete to start with. I would like to know when infinite variation can be successfully muzzled by the definite and concrete! Individuals who think this way are floundering in the second and static stage of education which Professor Whitehead of Harvard has defined as that of Precision, where regardless of actual facts everything is subject to exactness of formulation.

Fortunately all false systems and stultifying concepts carry within them the seeds of their own destruction.

In Angle's original groups there naturally happened to be some mature intelligent, free thinkers, some of whom, exercising the prerogatives of free thought and speech, promptly found unceremonious exits through his back door. As is the way with open-minded thinkers, however, numerous viewpoints and methods of dealing with the same basic problems have been evolved which are causing at present a considerable amount of confusion for those who are unfamiliar with the facts and are incapable or unwilling to go to the trouble of doing a little original thinking for themselves.

The specialty is, therefore, split for the time being, at least, into two irreconcilable camps whose methods and viewpoints follow almost exactly the diametrically opposite and conflicting patterns of Communism and Democracy.

It is as inconceivable to free-thinking orthodontists as it is to believers in the principles of democracy that there are individuals who are willing to be supine followers of any dictatorship.

Angle was the inventor and the original dictator of the philosophy of the "edge-wise" appliance and the methods employed in its dissemination. These same methods—youth indoctrination, cell infiltration (exclusive "Angle" study clubs), and satellite domination (Angle-dominated University Orthodontic Departments)—are being employed, if anything, in a more hide-bound and high-handed manner by the leaders of this particular creed today and with plenty of followers for several very simple reasons. However unphysiologically its therapy may trample on many of the most obvious biologic laws of nature, here at least is a definite "system" which can be "standardized" to fit infinite variation and reduce to a minimum the original thinking of those who employ its methods. "Standardized" results can be shown in convincing numbers by limiting these "demonstrations" to certain types of cases that do not contain difficult complications, and in which the use of the appliance itself would not only be completely impossible but also ludicrously absurd in view of the many other means which are available to accomplish the same purposes infinitely more simply.

I once asked a recent graduate from this school of indoctrination (naturally at the time without any personal clinical experience) whether it had not occurred to him that some things could be done more simply than by employing this particular appliance. He admitted that it had, but on suggesting this to his mentor was told, to use his *own* words, "I am here to teach the edge-wise technique," and that was that!

On the other hand, one of my former associates with whom I enjoyed twelve years of close professional contact, who had just finished a two-year course of postgraduate instruction in a department conducted by one of the best-known and able clinicians in this country, started in with an almost embarrassing sense of modesty. This modesty is always the mark of the men of true ability in clinical practice who are ever-conscious of the complexities and difficulties of orthodontics and their own human limitations. If there is one thing in the world calculated to create bigotry, conceit, and intolerance in orthodontics it is the worship of some specific mechanical appliance, particularly when it is not adaptable (which none of them are) to universal clinical application.

Angle was by nature basically a teacher and a pioneer and had the vision of what the possibilities of orthodontics held for the future. He possessed above this the ability to communicate this enthusiasm to his pupils.

With an enormous enthusiasm, the carefully selected superior body of men recruited from the ranks of successful general practitioners who constituted his original classes set to work and, as a whole, met with much success in their efforts due to the widespread demand for orthodontics of their times and the better methods of treatment which their concerted studies and efforts were able to produce.

The fairly large body of men constituting Angle's original graduates naturally soon became too busy in their private practices to handle the bulk of work with which they were swamped and, very naturally, took on carefully selected associates. These associates had an infinitely finer opportunity of learning the fundamentals of the practice of orthodontics than their preceptors by lengthy associations with men who had made clinical successes and were developing the originalities which have resulted in the enormous broadening of orthodontic concept and technical improvements since the days of Angle's original "expansion" arch.

The only solid but precarious ground upon which orthodontics stands today is the sum total of the practical experience and successful clinical results which have been obtained from the efforts of those who have pioneered in the work and have transmitted this working knowledge of the true nature of orthodontics to those who have followed them. There has therefore been in continuous operation the finest kind of unadvertised postgraduate school of orthodontics of which most of the outstanding present figures of the specialty are graduates. A study of the personal histories of the men who fortunately are still looked upon as the leaders in the specialty today reveals quite conclusively how their talents were developed.

Are we orthodontists going to allow this heritage to be lost and taken over by a group of clinical incompetents who are interested primarily in their own personal careers in the teaching field rather than in the broad interests of orthodontics itself?

The answer to this question is imperative, but it will take some determined concerted action to carry some imperative changes into effect and not simply the sound of a single voice crying in the wilderness.

It is perfectly obvious and clear how orthodontic proficiency may be achieved by those who innately possess the indispensable talents and are willing to take the time and effort to develop them under exactly the same conditions which are necessary in all the other forms of art. There is nothing even comparable to lengthy associations with successful masters in any field of artistic endeavor, but, as this is impossible in orthodontics for considerable numbers in private practices, the basic patterns for schools should, therefore, follow as closely as possible these conditions for the students in the colleges. The time element and the field from which to select the prospective material to make good orthodontists are of paramount importance. There is room for great doubt, except in very exceptional cases, whether the recent graduate is the most desirable material to choose from. What is still worse, the bars have been let down in some places to admit some of the most undesirable elements in this class by exploiting those who are able to pay for expensive and entirely too short courses (one year) of a highly academic nature but totally lacking in the all-important matter of practical training, and turning many of these misguided and inadequately trained individuals loose on a trustful and uninitiated public to practice the unfortunate blunders of judgment or technical inefficiencies which bring discredit and condemnation to the whole specialty.

It is my opinion, based on the practical experience and observation of the clinical development of my present and former associates, that it takes the equivalent of at least two years of intensive practical experience of a successful private practice to prepare any man, however gifted he may be, before he is fully grounded in the art of the practice of orthodontics, and ready to assume practice on his own responsibility.

The advantages of men taking up orthodontics as a specialty after a thorough and successful seasoning in general practice far outweigh in my opinion those of the recent graduate. In the first place, no man would be foolish enough to give up a lucrative general practice, particularly if he has heavy financial responsibilities, unless he is more than reasonably sure that he is sufficiently well grounded in his preparation for the specialty so as to have reduced his chances of possible failure to a minimum. Naturally no man could afford to give up his practice entirely, unless it was a very poor one, to spend a minimum of two full years at a postgraduate school. As has already been done, it is possible that his postgraduate instruction could be spread over a fairly long "part-time" course. This method is feasible and can at the same time give a man a far better opportunity to observe the results of treatment than is possible in the all-too-short courses which are at present in vogue. Furthermore, both he and his instructors would have the opportunity of finding out whether he has the innate qualities which are essential for the successful practice of orthodontics. The present orthodontic educational system is holding down the bars for induction into its ranks of some of the finest types of men who would add distinction to the specialty and who would serve their apprenticeships conscientiously within the bounds of their own practices.

A plan of this sort if fully developed would permit of slow overlapping and rotation of students, and give the clinical institutional patients a much better opportunity of getting some satisfactory treatment than they are getting in most institutions at the present time.

Naturally the details of a plan of this kind should have the careful consideration of a group of mature orthodontists and the wholehearted cooperation and understanding of the various deans.

An appreciation of the nature of orthodontics and its present requirements offers a rare opportunity to deans with vision and executive ability to carry some of these important and vital changes into effect.

There are several obvious suggestions which may be worthy of consideration to remedy the present immediate situation.

In the first place it is inconceivable that any man should be allowed to be in charge of *any* of the orthodontic departments of *any* of the universities in the country other than a man of long practical experience and recognized personal professional ability and standing in the specialty.

The fact that there are many different ideas both in concept and treatment in orthodontics is all the more reason the head of a department should be a man who has worked out these problems for himself and can teach and direct from the authoritative basis of his own experience a sane practical method of dealing with clinical problems which he himself can demonstrate that he possesses from his own clinical results. He should have under him a corps of men

of experience and ability who share his ideas and with whom he can work with complete cordiality and understanding. This is absolutely necessary to avoid confusion in the minds of students who are not yet prepared to form opinions of their own and to establish uniform principles and methods of procedure in treating the clinical patients. As there is nothing static in orthodontics and particularly its education, changes in methods and techniques should keep step with new developments at all times.

The conflicting differences of opinion which at present exist between orthodontists may appear confusing to outsiders, including deans. In expressing opinions, therefore, on this ticklish subject no man, however broad-minded he may be, can possibly be free from his own personal convictions or even prejudices, particularly if these are based on the successful results of his own practical experience. This can no more be avoided than it can in religion and, as a matter of fact, differences of interpretation of vital subjects are signs of active growth and vitality in understanding. It may take some time yet to have these differences ironed out, but there are some basic principles of universal application upon which it is reasonable to expect that we will all eventually agree and in the light of which many petty differences of opinion regarding techniques will be dissolved away.

At all times during my practice I have tried to keep an open mind and apply principles of universal application suitable to the treatment of the individual physical peculiarities of each individual case, and as there is not a single appliance which is applicable to all cases it is an absolute categoric necessity to be thoroughly familiar with a wide variety of them and employ them in the order in which they are most efficient depending on the transitional changes which always take place during the course of treatment of every single patient.

As the recent graduate in dentistry is dependent for his livelihood mainly on his clinical ability in operative dentistry, it is most unfortunate when the heads of these departments are not men who have achieved marked and recognized success in their own practices and are conscious of the practical application of the knowledge they try to teach. To have departments committed to the impratical visionary whims of full-time professors who are clinically incompetent and who interfere and antagonize men of infinitely greater clinical ability who may happen to be under them is the most deplorable situation that can exist in any institution.

My own personal ideas on the subject of what those general principles of universal application are and their clinical application have been fully covered in several previous articles. As a token of their practical application, however, I wish to conclude with a few case reports, a couple of which contain some troublesome features to be dealt with.

CASE REPORTS

Fig. 1 shows photographs of the models of an "unsatisfactory" dental occlusion of a patient in the early twenties. The photographs in Fig. 2 were taken within the first year of treatment. Broadly considered, the three funda-

mental conditions which are essential to a "satisfactory" dental occlusion, namely, structural balance, functional efficiency, and esthetic harmony, left considerable to be desired. As the age limit within which prophylactic measures might have been employed to influence growth and development had been passed, no time was wasted on any long and useless record of any of the numerous hereditary and environmental factors which may have been responsible for the condition as it presented itself for consultation, other than to note that there did not appear to be any acromegalic symptoms present in the general physical appearance of the patient.

The over-all picture of the malocclusion was so extreme that at first glance it did not seem possible to obtain a reasonable improvement without resorting to some surgical aid in the form either of an osteotomy or an ostectomy. This the parents of the patient and the patient himself very definitely refused to consider but were more than willing to assume any risk of failure if I was willing to undertake the treatment of the case by orthodontic means only. Some case reports are as exciting and as "standardized" as a trip across the river on a ferry boat, but as this case seemed to offer, by comparison, some of the romantic elements of the Trans-Pacific saga of the "Kon-Tiki" I undertook the treatment on that basis.

Fig. 3 shows photographs taken at the commencement of treatment with the patient biting in as near the position of "optimum occlusal relation" as his muscular function and the anatomic relations of the teeth and temporomandibular joint permitted. This picture showed that if the mandibular incisors were moved lingually to a reasonable degree, and if the maxillary incisors were moved labially, a more desirable relation of these teeth would be established and that through function the vertical relation of these and the molars would eventually adjust itself provided there was not too much traumatic impact while these changes were taking place.

With this basic idea in mind, an occlusal bite plate similar to the one shown in Fig. 9, *C* and *D* was constructed and fitted over the palate and occlusal planes of the maxillary teeth, and of sufficient height to relieve occlusal trauma during the period of mechanical tooth movement.

The movement of the mandibular teeth was effected by first obtaining the maximum of molar and premolar anchorage by inserting an 0.038 inch labial arch which was attached to all these available teeth with pin and tube attachments (this form of anchorage I very rarely use). The lingual movement of the mandibular incisors was then effected by nothing more complicated than by stretching a thin latex rubber band between the hooks which were soldered to the labial arch in the region of the canines, as shown in Fig. 3.

The labial movement of the maxillary incisors was produced by a plain labial arch of 0.038 inch wire attached to the molars, and a labial auxiliary spring of 0.020 inch wire activated labially and placed under the bracket hooks on the incisors, as shown in Fig. 3.

As the movements of the maxillary and mandibular incisors were taking place labiolingually, the occlusal bite plane was cut down gradually to allow for a not too severe trauma during the vertical readjustment of all the teeth involved.

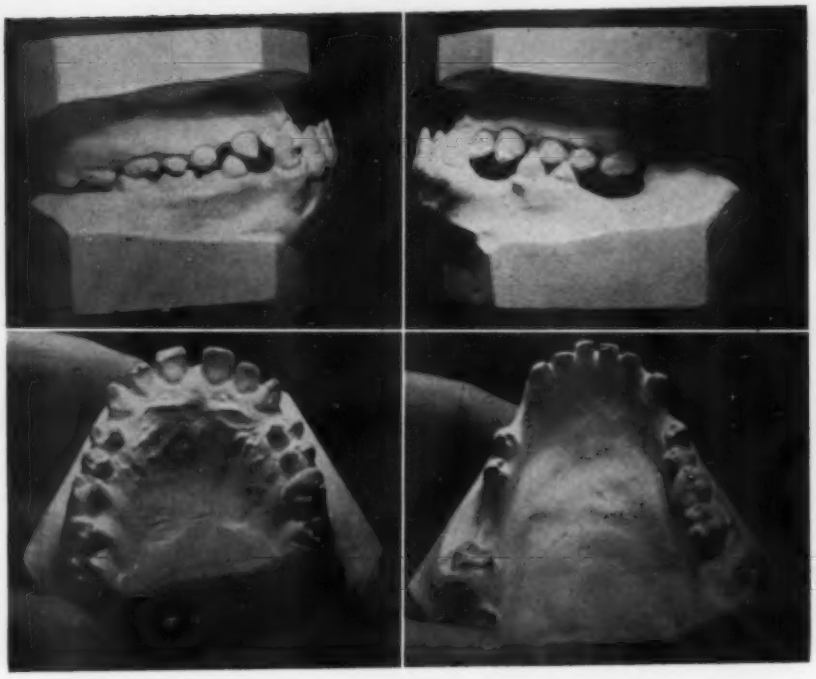


Fig. 1.

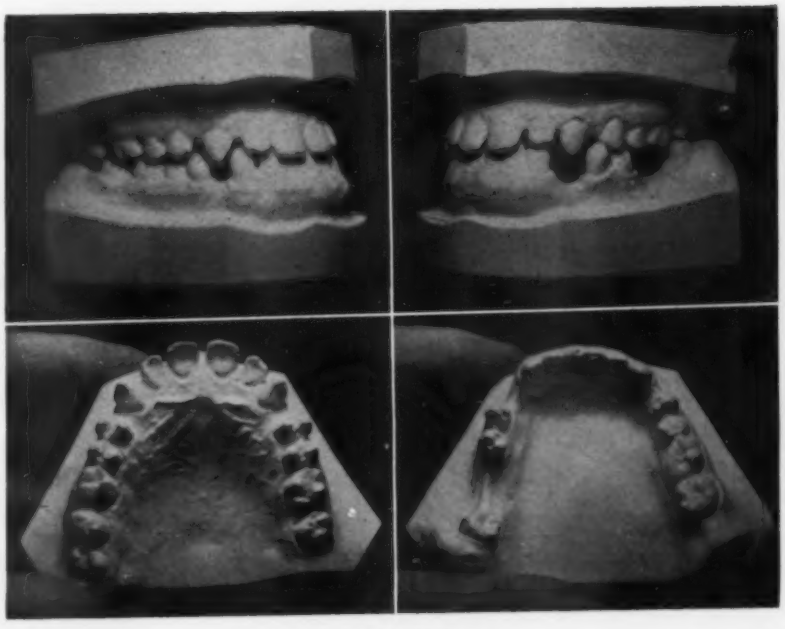


Fig. 2.

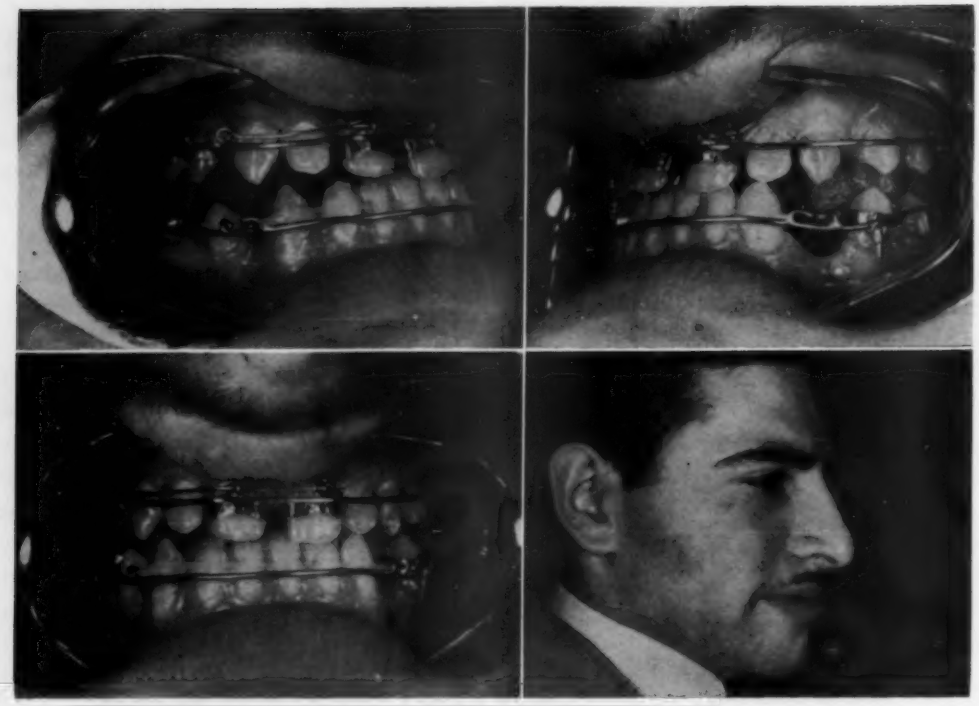


Fig. 3.

Fig. 4.

The results of this plan of treatment are shown in Fig. 4. At no time during the treatment was there any soreness or appreciable looseness of the teeth involved. As the quality of the teeth of the patient was of the poorest kind, as can be judged by the number of teeth which had already been lost, and decay was rampant even while this orthodontic work was being performed, all the fixed appliances were removed as soon as possible and replaced by Crozat

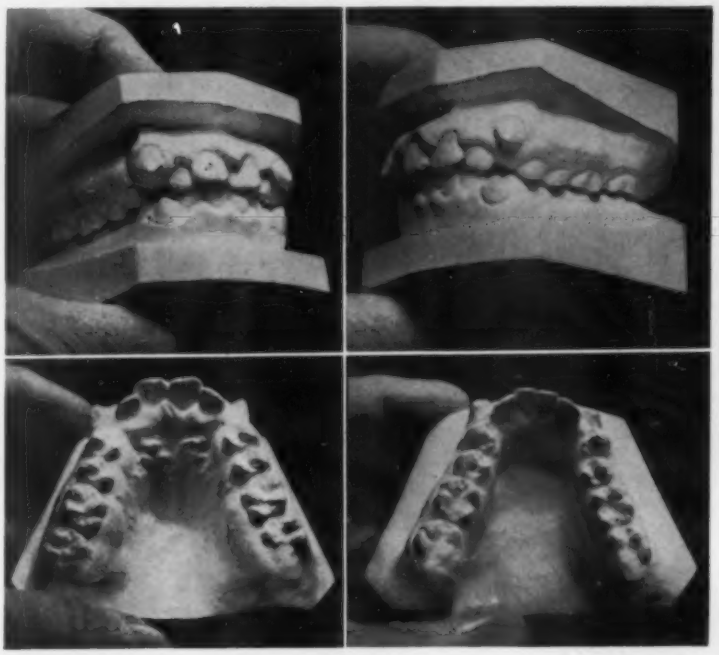


Fig. 5.

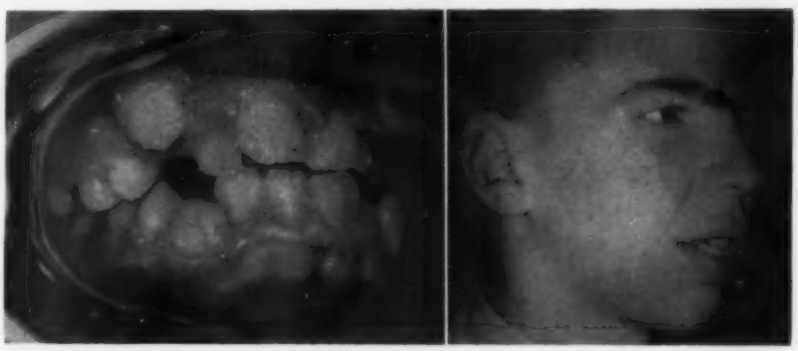


Fig. 6.

removable appliances, and a number of the final refinements of movement effected by arm and finger attachments soldered to the heavy body wires of these appliances.

The human body is generally conceded to be the most efficient functional piece of mechanism known to man's limited knowledge and intelligence. It is comprised of a body for stability, arms and legs for the grosser movements, and

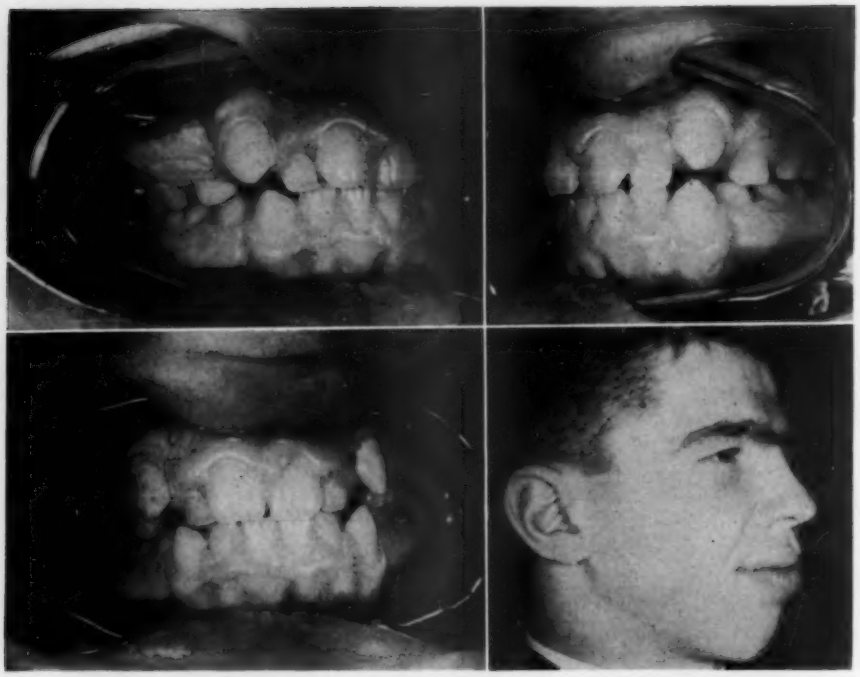
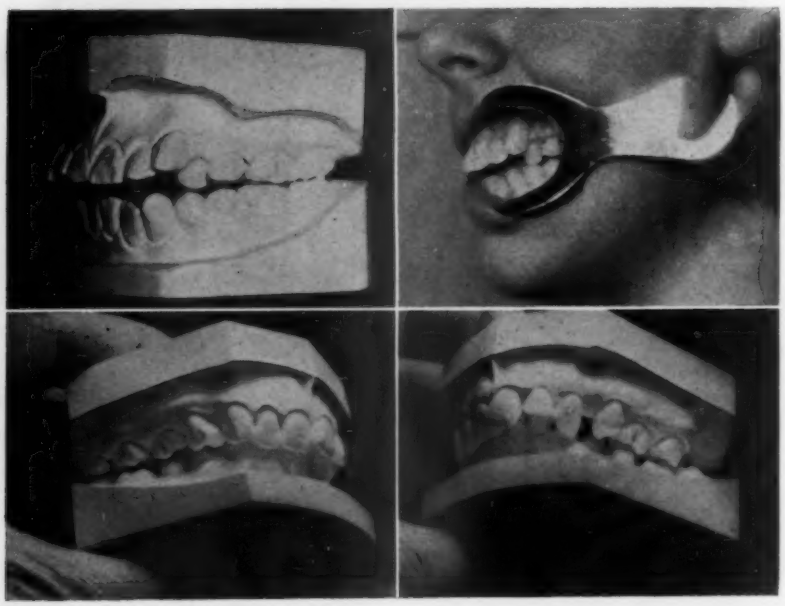


Fig. 7.

A.



B.

Fig. 8.

fingers for the lighter touches. For further efficiency inert objects such as ladders, pulleys, etc., are pressed into service. It would seem reasonable at least to apply the mechanical principles of the efficient human organism to our orthodontic problems.

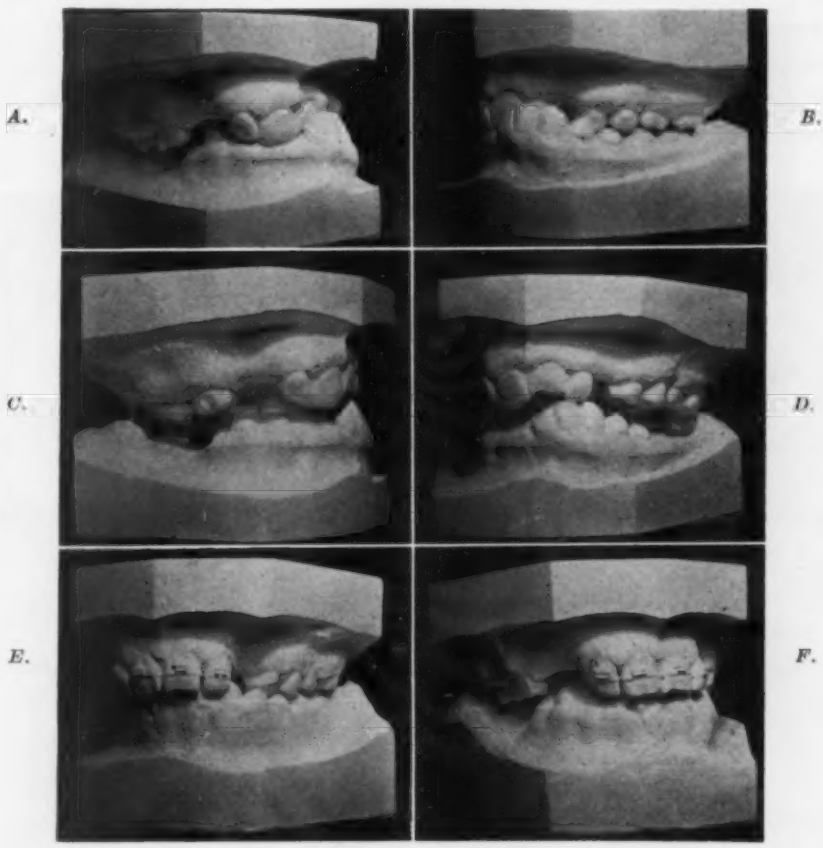


Fig. 9.

It will be noted by the illustrations that this basic mechanical philosophy has been used in the treatment of this case. To the so-called "golf-sticks" or arms of the Crozat appliance gentle finger springs were attached to effect some of the finer, most delicate tooth movements. These finger springs have the appearance of the snakes in the medical symbol of the "Caduceus" and might as well be dubbed with that distinctive cognomen at this time. If the principles of the multiple band appliances, which employ by comparison the equivalent of only a body to effect all tooth movements, are the ultimate in mechanical efficiency, I for one am afraid that the logic of this philosophical concept will never penetrate the Stygian darkness of my benighted mind.

The fantastic complications of some orthodontic cases, their subtle unexplainable nuances, and our own abysmal scientific ignorance of the true causes of some conditions are such that for the time being we can do no better than

to obey the dictates of our clinical experience and observation to keep out of inextricable trouble. Without any deeper reasons than the above statement I refer to the innocent-looking models in Fig. 5 as those of a case which from past painful and bitter experience is in my judgment packed with what I referred to earlier in this paper as "orthodontic dynamite." The hypertrophied aspect of the gums, the slight but yet definite condition of open-bite, the obvious maxillomandibular protrusion, and the flaccid appearance of the musculature of the lips spell disaster for practically any form of mechanical interference of a conservative nature.

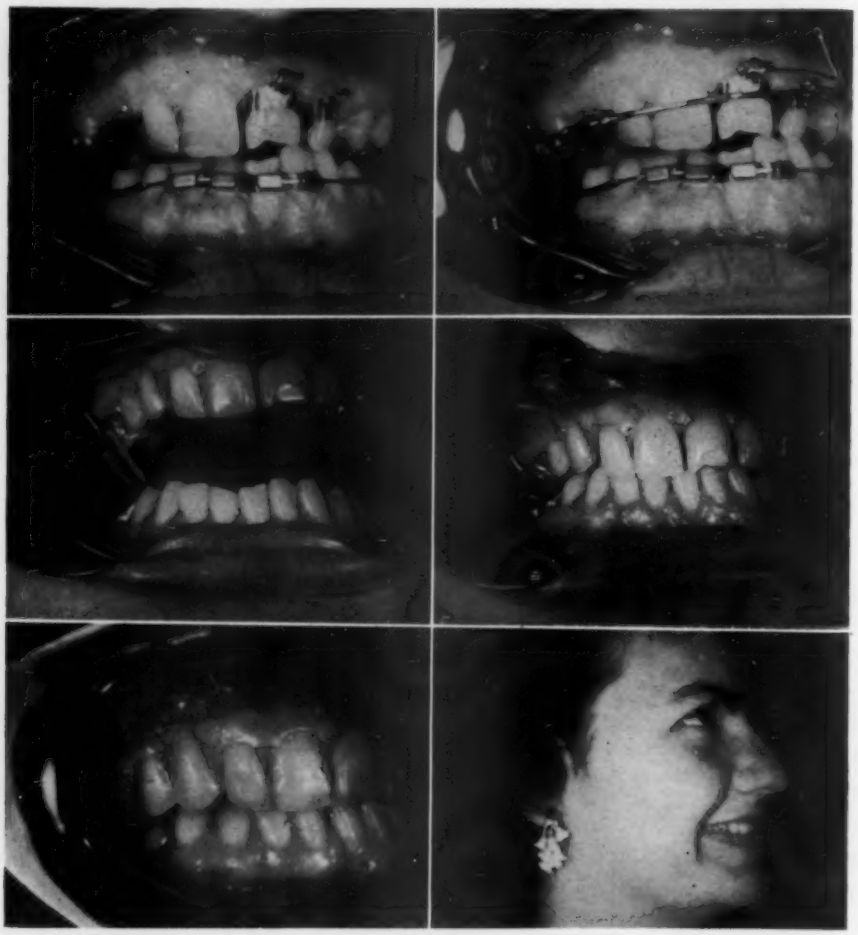


Fig. 10.

Fortunately, we have as one of our greatest allies the natural unaided readjustment of the tissues themselves which follows that most controversial of all subjects, the "judicious extraction" of teeth. In this case the four first premolars were extracted and the changes which have taken place between the conditions shown in Figs. 6 and 7 have been the result of unaided nature without the benefit of "tip-back bends," extraoral anchorage, or anything else in

the way of extraneous interference. Perhaps one of the most underestimated forces in orthodontics is what nature herself will do when given an unhampered chance, and that the best treatment in some cases consists in some correctly

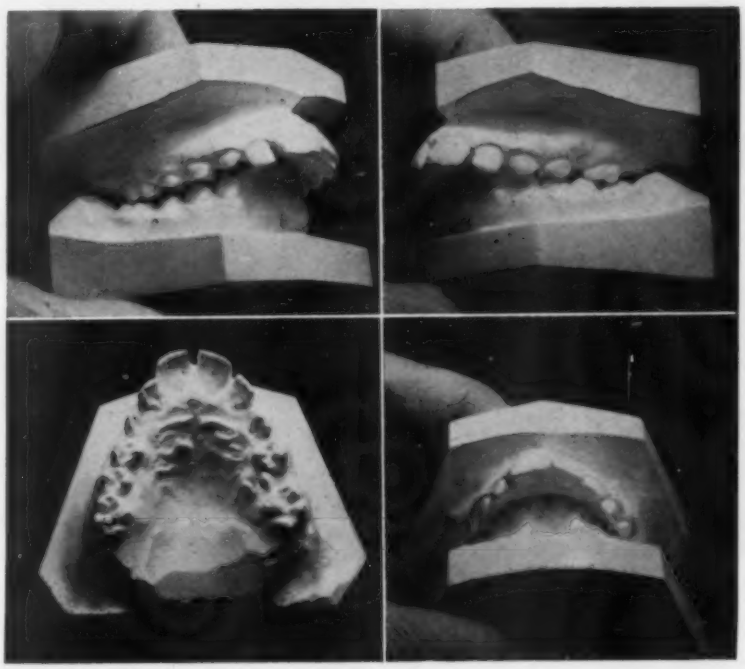


Fig. 11.

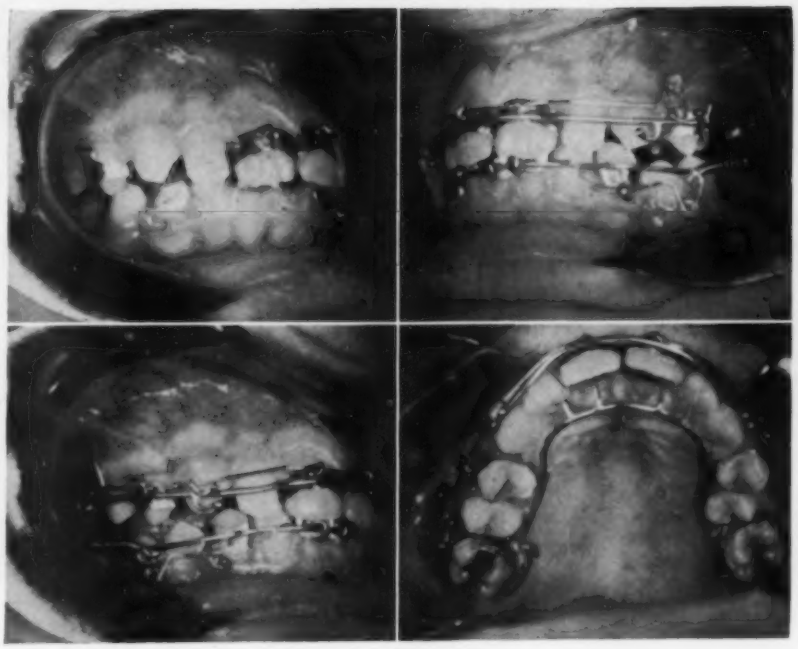


Fig. 12.

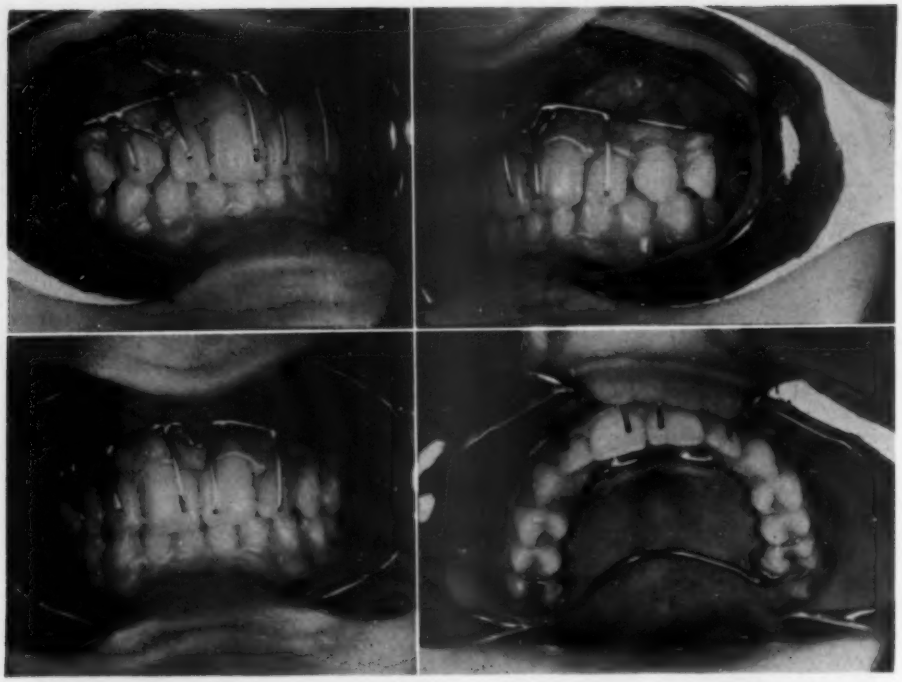


Fig. 13.

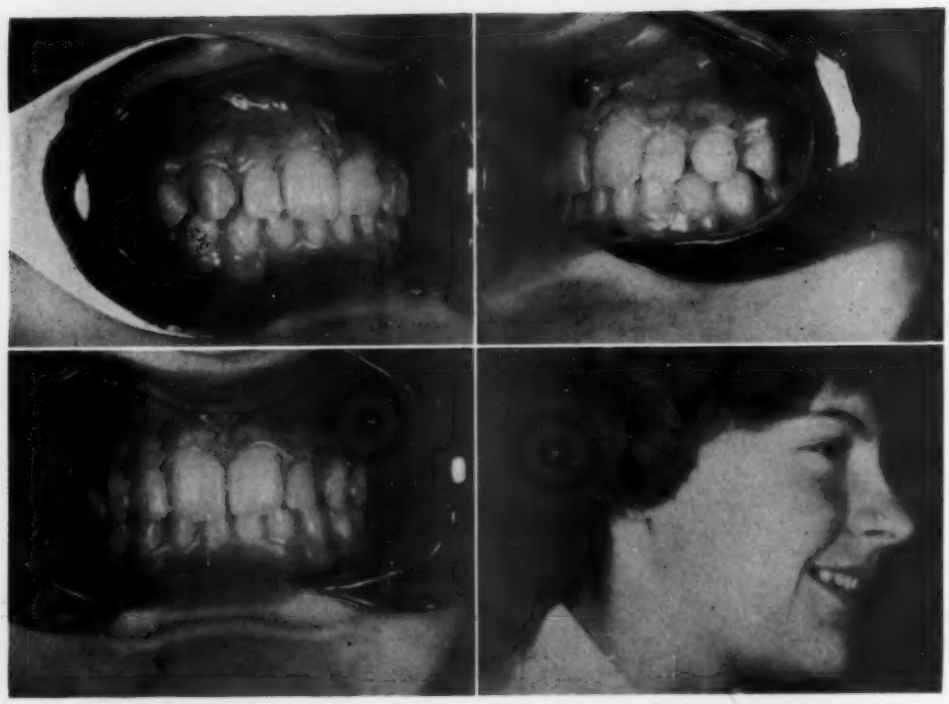


Fig. 14.

timed "innocuous desuetude" or, in simpler terms, "doin' nothin.'" It is quite possible that by the time the tissue readjustments which are taking place in this case are completed, no mechanical orthodontic treatment may be necessary.

Cases that have the clinical appearance just described when treated conservatively can explode almost overnight into calamitous conditions of open-bite, and regardless of how long and meticulously carefully the treatment may have been conducted to obtain the space for the crowded teeth, will relapse as quickly as if these organs had been embedded in crude rubber. There are plenty of problems in orthodontics which clinical experience teaches but which still need scientific explanation.

The cases shown in Fig. 8, *A* and *B* had both had five years of orthodontic treatment. The case in *A* was satisfactorily improved by the extraction of two maxillary premolars, but the case in *B* had practically been hopelessly ruined by unnecessary and injudicious extractions and inept treatment. The condition of the overbite is *one* of the determining factors in the problem of extractions. Where there is present a deep overbite it is just about as calamitous to resort to extractions as it is equally so *not* to in cases in which there is danger of producing an open-bite.

Fig. 9 shows a "definite" condition of malocclusion in an adult. By constructing a plastic occlusal bite plane, as shown in *C* and *D*, fashioned while the patient was biting in the position of "optimum occlusal relation," the traumatic condition was temporarily relieved while the teeth most deeply affected were moved to more desirable labiolingual positions. After these changes had been made, the plastic over the occlusal surface of the molars was gradually cut away to let the occlusion settle. The individual tooth movements in the first stages were effected by the use of a plain labial arch and auxiliary springs, as shown in Fig. 10, *A* and *B*. This was later changed to the use of a Johnson twin wire as shown in Fig. 9, *E* and *F*.

Fig. 10, *C* and *D* are photographs of the patient's occlusion toward the end of active treatment (ten months). A temporary plate is shown in place, replacing the missing teeth which were absent at the time treatment was started. *C* and *D* show an "in-and-out" elastic which was used to correct the buccolingual relation of the maxillary first molar and the mandibular second premolar. *E* and *F* are photographs of the case at the end of active treatment.

A case of distoclusion with labioversion of the maxillary incisors or Angle's Class II, Division 1 continues to be one of the hobbyhorses for differences of opinion regarding treatment. I include the case shown in Fig. 11 which was treated on the basic principle fully explained in previous articles of removing by natural (functional) and artificial mechanical means the interferences present to allow the mandible to assume a more desirable relationship to the maxilla. This was accomplished in this case by the fixed appliances shown in Fig. 12 and completed and retained by Crozat appliances shown in Fig. 13. The completed case is shown in Fig. 14.

At the present moment Crozat appliances have practically supplanted in my practice all other forms of retentive devices and are slowly and somewhat extensively being used in the active treatment phases of many cases.

THE APPLICATION OF THE EDGEWISE ARCH MECHANISM TO THE TWEED PHILOSOPHY IN ORTHODONTICS

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THIS paper will deal with mechanics per se and will differ in that respect from a paper read by me before the Central Section of the American Association of Orthodontists at Cedar Rapids, Iowa, in November, 1950.[1] In that paper not only was the Tweed philosophy treated at some length, but diagnosis and the method of making one were given considerable space. In addition a mass of material was presented to show the results of treatment, both from the point of view of favorably changed tooth and jaw relationships and favorable changes in facial balance or esthetics, each as a justification of the therapy employed.

In another paper published in *The Fortnightly Review of the Chicago Dental Society* and titled "Facial Esthetics in Relation to Orthodontic Treatment,"[2] I delve into material that may also properly be considered as preliminary to this paper and therein, too, make an effort to point to the criteria for the development of better facial balance and esthetics through orthodontic treatment. Further, the aims of orthodontic therapy are discussed at some length and are listed as (1) the best in facial esthetics, (2) the best in function, (3) the best in health of all of the structures involved, and (4) the best in stability. It was also carefully pointed out that in therapy, since it was desirable to maintain or place lower incisor teeth over base, it would be necessary to establish and maintain mandibular anchorage in the course of treatment, and in this paper every effort will be made to stress this point.

The paper on mechanics referred to previously herein was profusely illustrated with photographs of appliances taken directly in the patients' mouths, while the present thesis will be illustrated with photographs of appliances in the mouths of patients and supplemented by line drawings. In this way I hope to convey more clearly the action of the various components of the appliances and to depict more clearly the actual assemblage of the appliance.

We, therefore, should at this time take up the basic assemblage or fabrication of the edgewise arch mechanism. The first step must, of necessity, be the fabrication and the placing of the individual bands. This is elementary, of course, but the correct fitting, seating, and cementation of bands will eliminate many wasted hours later on in the course of treatment and will reduce to a minimum the hazards of tooth decalcification and decay provided we start with a fully restored dentition completely free of caries. It might be well at this time to point out that the proper tools or instruments are essential in the work we are to do, and they may and do facilitate our progress and make easier our task.

Presented at the Fall Meeting of the Northeastern Society of Orthodontists, Philadelphia, Pa., Nov. 13, 1951.

Bands are pinched directly on the various teeth in the mouth, using Angle band-forming pliers, No. 155 right and left and No. 155S right and left. The bands are so placed in the pliers (Fig. 1) that pressure upon the handles of the instrument compresses the band material around the tooth to fit it snugly (Fig. 2) and then, by a rotating motion of the pliers, both mesiodistally and incisogingivally, and with more pressure on the plier handles, the band material is more closely adapted to the tooth. Since we at our office use stainless steel band material, we cut off one end of the tail at the marking made by the band-forming pliers and the other end about 1 mm. beyond the marking and make a lapped welded joint directly on the mark. For lower incisors we use band material of 0.003 inch thickness by 0.125 inch width; for upper incisors, cuspids, and premolars the material is 0.004 inch by 0.150 inch; and for molars material is 0.005 inch by 0.180 inch in width. For most cuspids, contoured bands are used with the brackets set as closely as possible to the incisal edge. All bands carry edgewise brackets centrally placed prior to pinching the band material around the tooth. The last molar band carries a 0.022 inch by 0.028 inch buccal tube and where second molars are banded, the first molars carry a wide edgewise bracket. Some lower first molars are banded with contoured bands, and when these are used the brackets are soldered after fitting. When satisfactory cuspid bands cannot be placed, cast cuspid bands are fabricated and the brackets are placed after fitting. May I at this point digress to explain that the process of forming the band around the tooth we designate as pinching, and the step of adapting the band to the tooth after it has been welded we consider fitting. Up to this point the only difference that I can note in this technique as opposed to one using precious metal banding material would be in the welding step, as opposed to a soldering step; and in soldering a butt joint may be preferable. All incisor bands are pinched on the lingual, premolar bands are pinched on the buccal, as are lower molars except when lower contoured molar bands are used; then they are pinched on the lingual. Upper molars are pinched on the lingual. Whenever possible second molars are banded.

In fitting the bands to the teeth, we drive our bands to place with a Hollenbeck automatic gold foil condenser. Frequently, we may have to stretch the bands to set them to the desired position. Starting with either the upper or lower first premolar, the band is driven and adapted to the tooth. All occlusal overhang is removed with a large stone. The band is reseated with the bracket in its correct or best position on the buccal surface, and at that time the bracket location, as related to the buccal cusp, is measured with Starrett dividers adapted for this purpose by shortening one leg of the dividers. The instrument for this purpose was first suggested to me by Dr. Harry Bull of Jersey City. All I did was to add a male attachment to the short leg that would not only fit into the bracket slot but would also be adapted to the bracket wings (Fig. 3). This seemed to me to be a bit more exact.

The dividers are now set and are used for the bracket and buccal tube positions on all of the buccal teeth in that arch. Hooks are soldered on the mesio-buccal-gingival aspect of the last mandibular molar bands, to receive

Class II elastics. This position avoids rotation of the anchor molar when using elastics. We like to place our incisor brackets incisally to the point that the bracket position as such would tend to depress the incisors, both upper and lower. On the lower incisors all brackets are set at the same distance from the incisal edge, but on the upper incisors the lateral incisor brackets are so set as to finish the case with those teeth a little shorter than the central incisors. When the upper incisors are fitted, they are driven to place and bracket positions checked. The lingual surfaces of these bands are now adapted to the lingual contour of these teeth with ball burnishers, after which solder is flowed into this contoured area to strengthen these bands so that the tremendous functional stress against these bands would not dislodge them (Fig. 4). This very valuable step, reducing to a minimum the need for recementation of upper incisor bands and practically eliminating not only the fear of, but also the actual occurrence of, white decalcification on the lingual or labial surfaces of upper incisors, was also suggested to me by Dr. Bull. Molar bands are fitted by driving the band well down so that whenever possible the band fits slightly under the free margin of the gum tissue. The bands are contoured to the lingual and buccal grooves of the teeth and all occlusal excess is removed with a large stone. This is also done with mesial and distal excess on cuspid and incisor bands. Now that the bands are fitted a mesial and a distal staple are placed on all bands except the molar bands that carry the buccal tubes. When staples cannot be placed as usual they may be soldered on the lingual surface. Failure to place staples as suggested frequently results in many hours of extra work. If an office is well organized and has a good laboratory technician there is little reason why the soldering of brackets and staples to the bands and the welding of bands cannot be delegated to others. After staples have been soldered and the bands polished, the bands are once again adjusted to the teeth and then cemented (Fig. 5). It is needless to say, of course, that throughout the band-forming and cementation procedure adequate separation must be present. It is not necessary to advise concerning the number of bands to be cemented at one time or with one mix. Attention is merely directed to the fact that careless cementation procedures could easily make ineffective a very careful band technique.

For the purpose of clarity it might be well at this time to consider arch bending technique. All of our full arches are formed to conform to the origi-

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Fig. 1.—The armamentarium for pinching edgewise bracket bands, showing at the top contoured molar band followed by molar band, both 0.005 by 0.180 inch; premolar band, 0.004 by 0.150 inch; lower incisor band, 0.003 by 0.025 inch; contoured cuspid band, 0.004 by 0.150 inch. There are four pliers in the set: right and left convex, No. 155, and a right and left concave, No. 155S. A plier with a band in place ready to be pinched around the tooth.

Fig. 2.—*A*, A premolar band being pinched from the buccal with a bracket shown on the lingual. The No. 155S pliers are used for premolars. *B*, A lower incisor being pinched on the lingual. The No. 155 plier is used for all bands other than for premolars.

Fig. 3.—The modified Starrett dividers being used to measure bracket and band position on the teeth.

Fig. 4.—Soldered reinforcement shown on the lingual of the upper incisors.

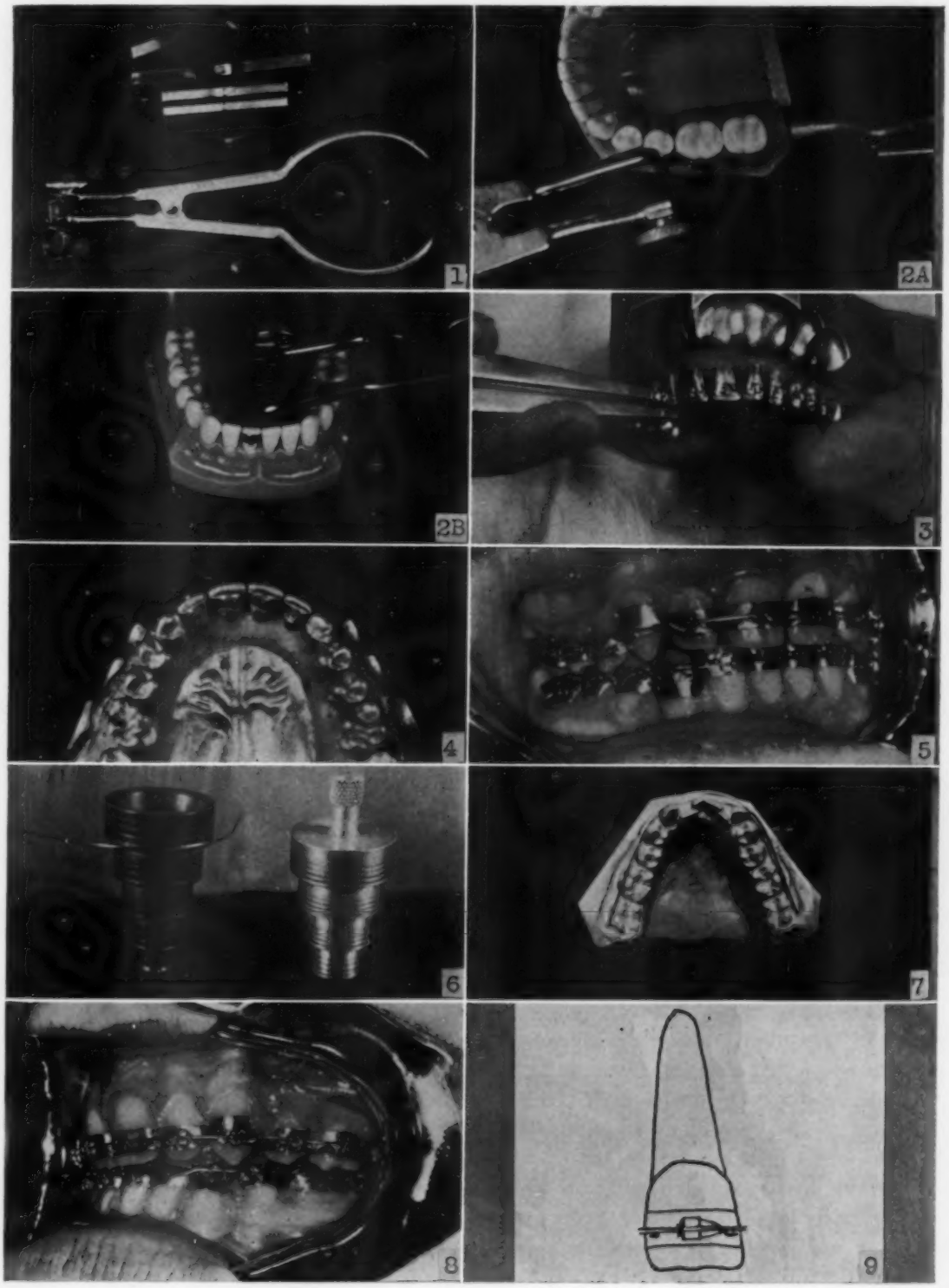
Fig. 5.—Completed edgewise bracket band assemblage showing mesial and distal staples on all bands except on the last molar bands which carry 0.022 by 0.028 inch buccal tubes. Note hook on last mandibular molar band at the mesiogingival buccal aspect to receive elastics.

Fig. 6.—Arch formers showing the manner in which arch is set into groove for forming.

Fig. 7.—Arch adapted to lower model in malocclusion without expansion.

Fig. 8.—Small round arch, 0.016 inch, used to start a case in limbering up process.

Fig. 9.—The method of tying a rotation, first through the staple and then around the bracket to keep the rotating action continuous over a longer period of time.



Figs. 1-9. *(For legends, see opposite page.)*

nal malocclusion, for in our orthodontic procedures there is no place for expansion as such, except in crossbite cases, either anterior or posterior, or for individual teeth that are obviously in lingual position. Arches in the edgewise technique are of various sizes, viz., 0.016, 0.018, 0.020, 0.022, and 0.021 by 0.025 inch and 0.022 by 0.028 inch. All of the arches are stainless steel. The arches are fabricated on a turret arch former with grooves to take any of the previously mentioned arches (Fig. 6). The arch form is definitely adapted to the malocclusion (Fig. 7). The forming is done by starting with the largest portion of the turret and coming down to the smaller forms until the correct general shape is achieved. Final bending is done with fingers or pliers. Stops or tiebacks are usually fashioned directly in the arch material with pliers, but may be soldered by using brass wire of about 0.020 inch diameter as the stop material. This is done when space is short for a formed stop, but care must be taken in soldering not to heat the arch wire and render it useless. All arch wires are bent with a tip back for the molar sheaths to initiate the uprighting or tipping back of the most distal teeth. Lingual bends are usually placed on the last banded molar teeth. Arch wires are now heat-treated at 850° F. for three or more minutes, then allowed to cool in air, and are polished by submersing in acid. Deviation in arch forms from this point on will be treated in the various steps in therapy as they occur.

Tweed has aptly said that if we as orthodontists know our goal, we will be able to devise a means for attaining it.[3] Those who follow the Tweed philosophy and use the edgewise arch mechanism have a definite plan or routine to follow in therapy.[4] If the lower incisors are not over base they must be placed there in treatment; if they are over base, they must be so maintained. If more mandibular anchorage is desirable or required, these teeth along with all the lower cuspids and buccal teeth must be tipped back, the buccal segments distally and the labial teeth lingually. The problem may be very simply stated and be almost all embracing by putting it as follows: The mandibular incisors in treatment must be placed and/or held relatively upright over the mandibular base. All other mandibular teeth must be placed in correct proximal contact to adjacent teeth and in the correct axial inclination to the basal bone and to each other. The maxillary teeth then must be occluded with the mandibular teeth and must also be in correct axial inclination to their base. All this must be done without expansion except as previously stated in cross-bites. If in treatment the lower incisors cannot be placed upright to base without expansion, then dental units must be removed so that the mandibular incisors may be correctly positioned. In extraction cases four first premolars are the units of choice to be removed, but this choice is tempered by conditions as they exist in the patient's mouth, examples of which are teeth that have large fillings, are badly decayed, are pulpless, or malformed, or that are disadvantageously positioned for movement. It might be called to your attention that I, as well as many others, notably Charles H. Tweed, have pointed out that usually (although not always) the more the lower incisors are set lingually, the more is facial esthetics improved. This applies definitely to patients with large Frankfort-mandibular plane angles,[5] and immediately draws attention to the limitations of orthodontic treatment.

With the above preliminary steps covered, and with the above comment as to aims and goals of treatment, and with the limitations as above imposed upon our ability to upright lower incisors over base, we are prepared to proceed with treatment and will select first the nonextraction case.

We have cemented edgewise bracket bands on all the teeth with a mesial and distal staple on all the bands except the last molar bands which carry the rectangular buccal tubes. The second molars have been banded if possible. The steps now follow each other according to a plan.

An 0.016 inch arch wire is placed in each dental arch and they conform to the malocclusion. A tip back is placed for the last tooth on each side in each arch (Fig. 8). A slight lingual tip is placed at both ends of the arches. Spaces are gathered up by cinching up the arches; therefore, the tiebacks must be anterior to the buccal tubes. After a limbering up process and after bracket engagement is attained, the same procedures are followed with 0.018 inch and 0.020 inch arches; and now in addition to cinching to close spaces, rotations are ironed out by ligating through the correct staple on the rotated tooth; first, to the arch which is thus caused to spring and then drawing the ligation ligature through the bracket wings to keep it active for a long period and to keep the ligature from slipping (Fig. 9). All this time, the insertion of the larger arches, all formed to the malocclusion and even slightly contracted to avoid expansion, continues to level the occlusal curve. This reduces the anterior overbite. Any arch wire conformed to the tooth arch when seated into the flat slot of the edgewise brackets on the incisors and then ligated tends to expand that arch in the buccal segments. Therefore, the arch is frequently contracted before being seated.

The last and largest-sized arches placed are 0.021 inch by 0.025 inch and by this time rotations should be corrected, the curve of Spee and the overbite reduced, and in most instances the spaces closed (Fig. 10). In difficult rotations the rotating bar is used (Fig. 11) and made of 0.018 inch arch material.

Now if a Class II condition exists, tip back bends are placed in both arches which are now rectangular, 0.021 inch by 0.025 inch. A tip back is placed at about the center of each interbracket space all the way forward to and including the space between the cuspids and lateral incisors. These bends are made by holding a 442 or a 142 plier on the interbracket mark, made with a file, scissors, or white pencil, and if in the maxillary arch, by bending the distal segment up with the thumb or fingers and the mesial segment down (Fig. 12). Both segments should be parallel. The plier is now moved forward to the next mark, the wire bending process repeated, and now we have three segments all of which should be parallel and offset the same degree. This process is continued until the last interbracket mark is worked over; then the same steps are followed through on the other side of the arch. The distal tip back is increased now slightly over the others and tiebacks are placed snugly to the upper buccal tubes if no spaces exist in the maxillary arch, and slightly forward to the tubes if there is some spacing (Fig. 13). Note here that in none of the arches were lateral incisor inserts placed, for I in my study of excellent

nontreated dentitions have not observed that the lateral incisors are lingually placed, but on the contrary their labial surfaces are in the same curvature as are those of the central incisors. This upper arch is now tied in with coordinated torque, i.e., with the incisal segment of the arch as it seats into the brackets parallel to the tip backs in the buccal segment. The arch is tied in and tied back snugly to create a unit of anchorage. Hooks have been placed between the upper cuspids and incisors to receive extraoral force to augment the anchorage in the upper arch as Class III elastics are used (Figs. 14 and 15).

The lower arch is treated as is the maxillary arch in placing of tip back bends, except as the 142 plier is held on the distal interbracket space, the distal segment is bent down and the mesial segment up, and so, until all the bends are made on both sides. The tip backs in the mandibular arch, however, are greater than those in the opposite arch and again, too, the last tip back is somewhat exaggerated. Class III hooks are placed between the lateral incisor and cuspid bracket to receive Class III elastics. The incisal segment here, as above, should be parallel to the buccal tip backs, but for the beginner or the timid the incisal segment may be rounded if the operator fears that the mandibular incisor roots may be torqued too far labially. This arch is *not* tied back but the stops are definitely against the buccal tubes to prevent buckling of contacts in the lower arch. Now, the patient wearing Class III elastics constantly; the mandibular buccal and incisal segments are set back until the molars, premolars, and cuspids are leaning distally and the incisors are leaning lingually. The patients are instructed during this period to use extraoral force on the maxillary arch all night long and as much more time as possible, to augment the resistance in the maxillary arch. At subsequent sittings, if need be, the tip backs in the lower arch are increased but the stops are kept against the buccal tubes. The upper tip backs also may be increased slightly and tied back more tightly to keep the anchorage from giving way even though supplemented by extraoral force. As tip back bends are increased it may be necessary to make new arches so that they may be seated into bracket engagement. When the mandibular teeth are advantageously placed to resist Class II elastics, mandibular anchorage has been established and we are ready for Class II mechanics.

In Class II mechanics we use the same arches where possible, increasing the bends slightly in the mandibular arch and more drastically in the maxillary arch, and now tying the lower arch back tightly to create a unit of anchorage. The maxillary arch is *not now* tied back but the stops are against the

Fig. 10.—Rectangular arches in place with spaces closed and overbite reduced.

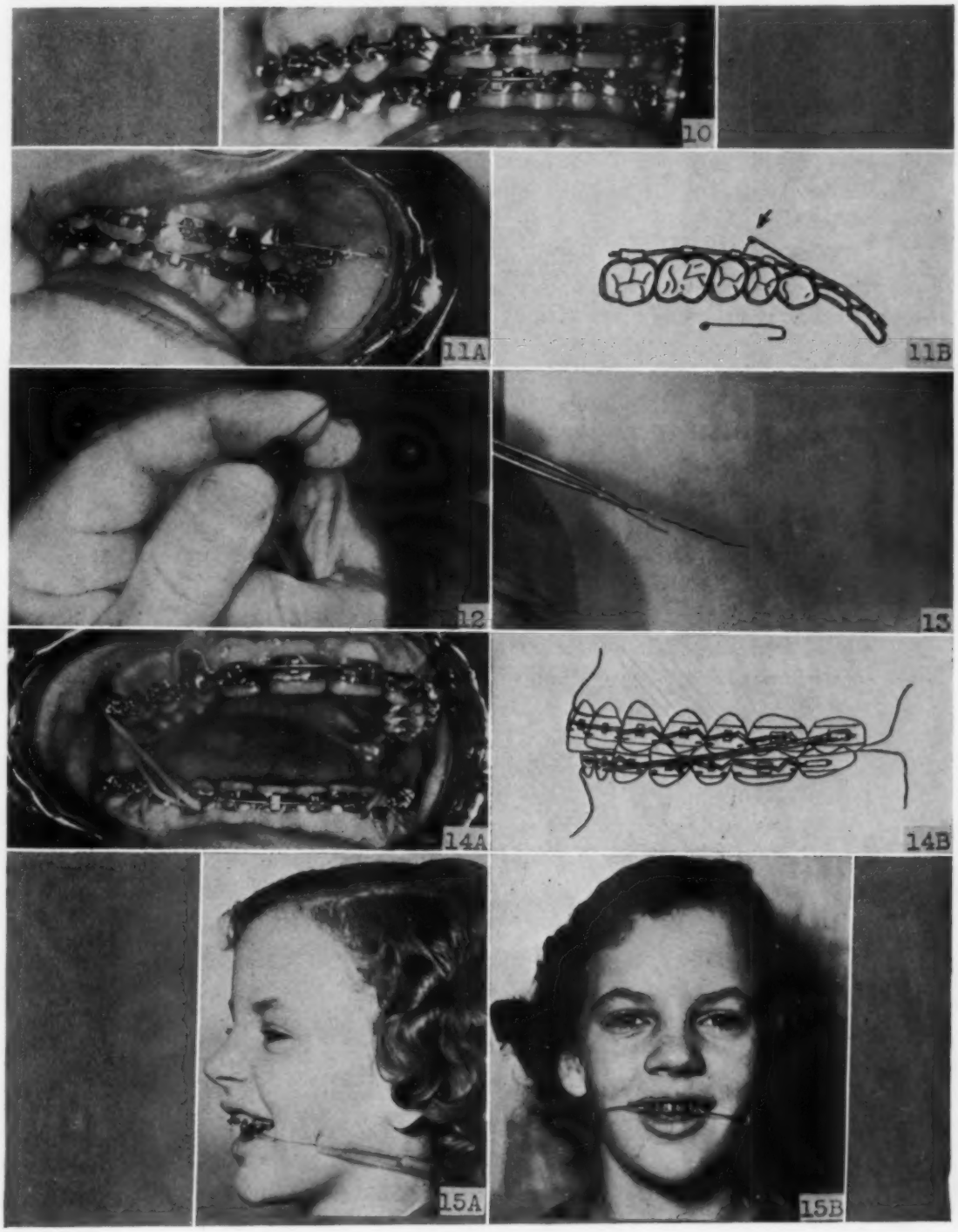
Fig. 11.—*A*, Type of rotating lever ready to be tied in and activated; used in difficult rotations. *B*, Schematic drawing of rotating lever showing how lever is bent to fit under wings of bracket of tooth to be rotated.

Fig. 12.—Placing tip backs in the arch with No. 142 or No. 442 plier using thumb and first finger to make bend.

Fig. 13.—Arch with tip backs incorporated showing accentuated bend at the end of arch.

Fig. 14.—*A*, Class III mechanics in use, tip backs in lower arch. Tip backs in the upper arch and the arch tied back tightly. Note upper right cuspid cast band. Also note hooks on upper arch to receive extraoral force. *B*, Schematic drawing of Class III mechanics. Note depression offsets for the incisor teeth in both upper and lower arches.

Fig. 15.—*A*, Extraoral force used with Class III mechanics. *B*, Anterior view of *A*. Note that the plastic tube shown in the illustration has been replaced by an elastic fabric cervical band.



Figs. 10-15. *(For legends, see opposite page.)*

molar tubes to prevent contact breaks in that arch. Here, as before, in the opposite arch, the timid may round the incisal segment of the upper arch if they fear the roots may become too prominent in the incisal segment. Class II elastics are worn continuously, extraoral force is discontinued, and as need be the upper tip backs may be increased (Fig. 16). The offset in the arches, between the cuspids and lateral incisors, tends to open up the bite. The tip backs in general also tend to do this. Class II elastics are worn until the mesiodistal cuspal relationship is slightly overtreated and the incisors are about end to end.

If at this time a tooth midline discrepancy exists with a unilateral distoclusion, then the mesiodistal and the midline discrepancies are adjusted by the use of Class II elastics on the side of distoclusion and Class III elastics on the opposite side of the dental arches[6] (Fig. 17). The incisors are carried to about end to end as in treating Class II conditions. The teeth are then checked for rotations and axial inclinations, elastics are removed, and the teeth are allowed to settle. If they settle well and do not relapse, provision is made to remove the appliance and place retainers. If the teeth do not settle well, hooks are placed on both arches at advantageous locations and the cusps are seated with vertical elastics (Fig. 18). In finishing, a few bands may be removed and the arches cinched to close band spaces, but I find that band spaces usually close uneventfully when the appliances are removed.

The treatment of extraction cases differs only in the closure of spaces at the site of extractions and then the closure of the incisor spacings created by the movement of the cuspids distally into the premolar spaces. When all the spaces are closed the same procedures that have been enumerated in the nonextraction cases are followed. I will, for treatment purposes, recognize two types of extraction cases, viz. (1) crowded cases, the usual example of which are the locked-out cuspid cases, and (2) all others. In the first group the four first premolars are extracted and upper and lower fixed lingual arches (Fig. 19) are placed until the cuspids and/or other crowded teeth assume the best positions they may under the lingual arch management. Then either they are ready for full band and arch management as in nonextraction cases or they require space closure techniques which we will take up at this time.

Fig. 16.—*A*, Class II mechanics used after establishing mandibular anchorage. *B*, Schematic drawing of Class II mechanics. Note depression offsets in both arches for incisor teeth.

Fig. 17.—*A*, Shift elastics; Class III on one side, Class II on the other side to adjust a midline discrepancy. *B*, Schematic drawing of *A*.

Fig. 18.—Vertical elastics to seat cusps.

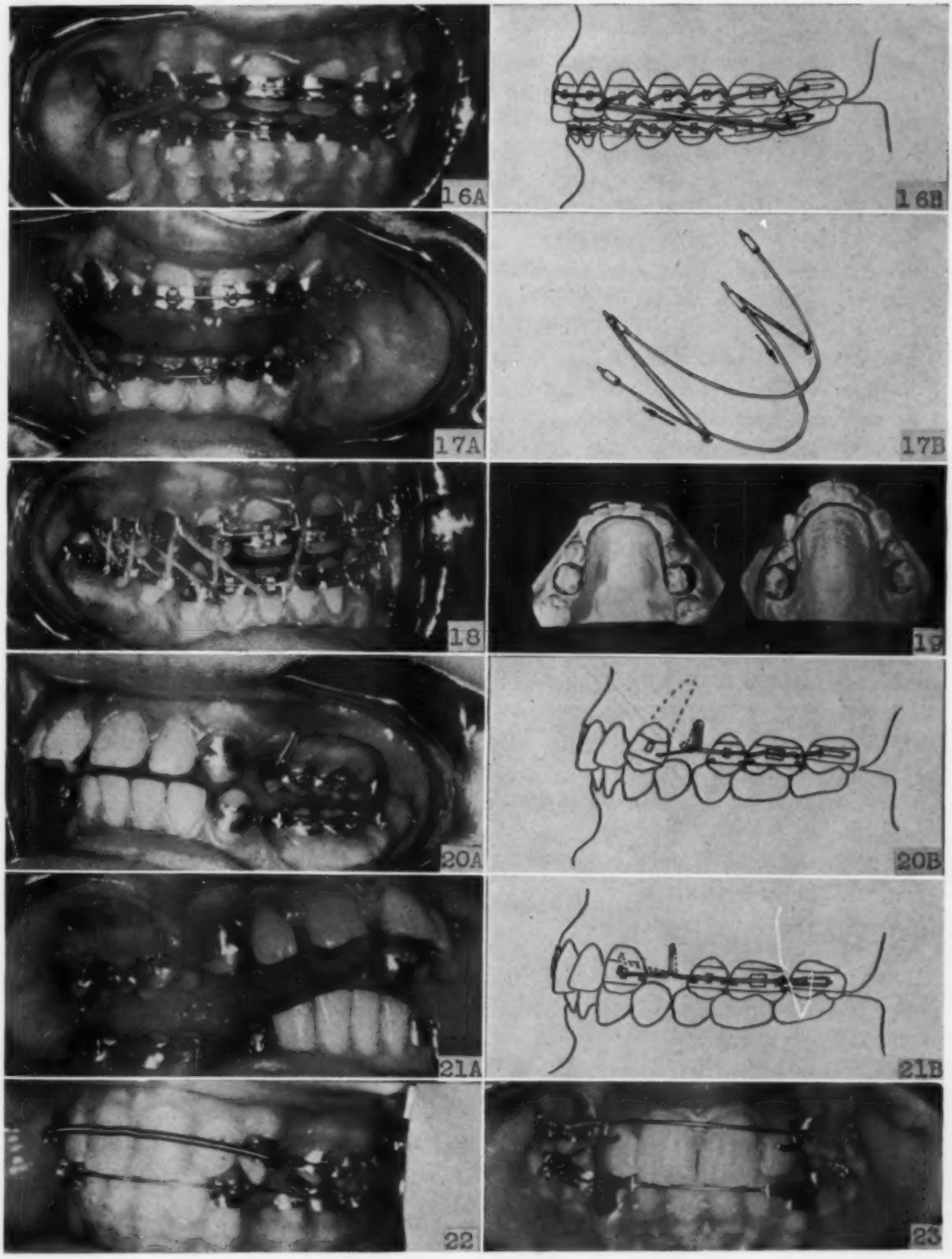
Fig. 19.—Fixed lingual arches used in crowded extraction cases to allow cuspids to erupt and move distally. This device taxes anchorage to a minimum.

Fig. 20.—*A*, Sectional arches with tip back bends tied into distal staple of a mesially tipped cuspid in an extraction case to upright the cuspid. *B*, Schematic drawing of *A*. Note stop against buccal tube and tied in. Activation is from distal cuspid staple to eyelet at the mesial end of vertical loop.

Fig. 21.—*A*, Sectional arch without tip backs, seated in cuspid bracket by means of ligature through distal cuspid staple then to cuspid bracket, this to prevent rotation of cuspid as it moves distally. The loop is activated from the stop anterior to the buccal tube by a ligature tied around the distal of the buccal tube. *B*, Schematic drawing of *A*.

Fig. 22.—Cuspid-to-cuspid coil for moving cuspids distally. The text of the paper has these arches rectangular with tip backs and securely tied in. This type of coil is now being used with a round 0.020 inch arch without tip backs and not tied back. The lip action keeps the coil active. Using coils in this manner appears to strain anchorage less than when arches are tied in. This method of using coils to retract cuspids was suggested by George Englert.

Fig. 23.—Coils against stops to move cuspids distally.



Figs. 16-23. *(For legends, see opposite page.)*

As in crowded cases, so in the second group, four first premolars are removed and bands are placed on all the buccal teeth and the cuspids. Full arches may be used to align the brackets, but as soon as possible provision is made to carry the cuspid distally into the extraction spaces. This may be done in several ways.

First, by means of sectional arches. If the cuspid is tipped mesially the sectional arch carries tip backs, is tied back securely, and is activated from the loop through the distal staple on the cuspid band (Fig. 20). If and when the cuspids are relatively upright, a mashed or Bull loop is used. In the use of this arch the procedures suggested by Harry Bull are followed. No tip backs, as such, are placed in these sectional arches but the short lever, anterior to the loop that engages the cuspid bracket, is tipped gingivally to the bracket so that as it is seated the long arm distal to the loop becomes one large tip back, when the short anterior lever is raised occlusally to be seated. Besides the mashed loop there is incorporated in the sectional arches a small bend just anterior to the cuspid bracket to keep the arch secure, and a tieback anterior to the buccal tube to allow for activation. The arch is so bent that it seats readily in the brackets and at the same time is contoured lingually in the cuspid area to keep those teeth from tipping labially (Fig. 21). These sectional arches are tied in to the cuspid brackets through the distal staple and then around the bracket wings, to keep the cuspids from undesirable rotations. Then the tiebacks are cinched to the hooks on the molar bands below and to the distal of the buccal tubes above, opening the mashed loop a small amount. Then the arch is seated in the brackets of the first molars and second premolars to complete the ligating sequence. At subsequent sittings (in our office, three weeks) the loops are reactivated, always being careful that the arm engaging the cuspid bracket is bent gingivally. Rectangular arch material is used for these sectionals. The process is continued to the point where the cuspids are relatively upright and when ample space is present to upright the lower incisors to base or, if need be, even to tip them lingually to base. In the step just described there is no question that the posterior teeth move forward and that is usually what is desired. When, however, all the extraction space is needed and even that may not be adequate, then our techniques are usually found wanting and our ingenuity is taxed to the utmost. To the degree that the posterior teeth can be kept from coming forward, will our results reflect the finest in orthodontic efforts.

Second, cuspids are carried distally by means of full coil springs from cuspid to cuspid in each arch using rectangular arches 0.021 inch by 0.025

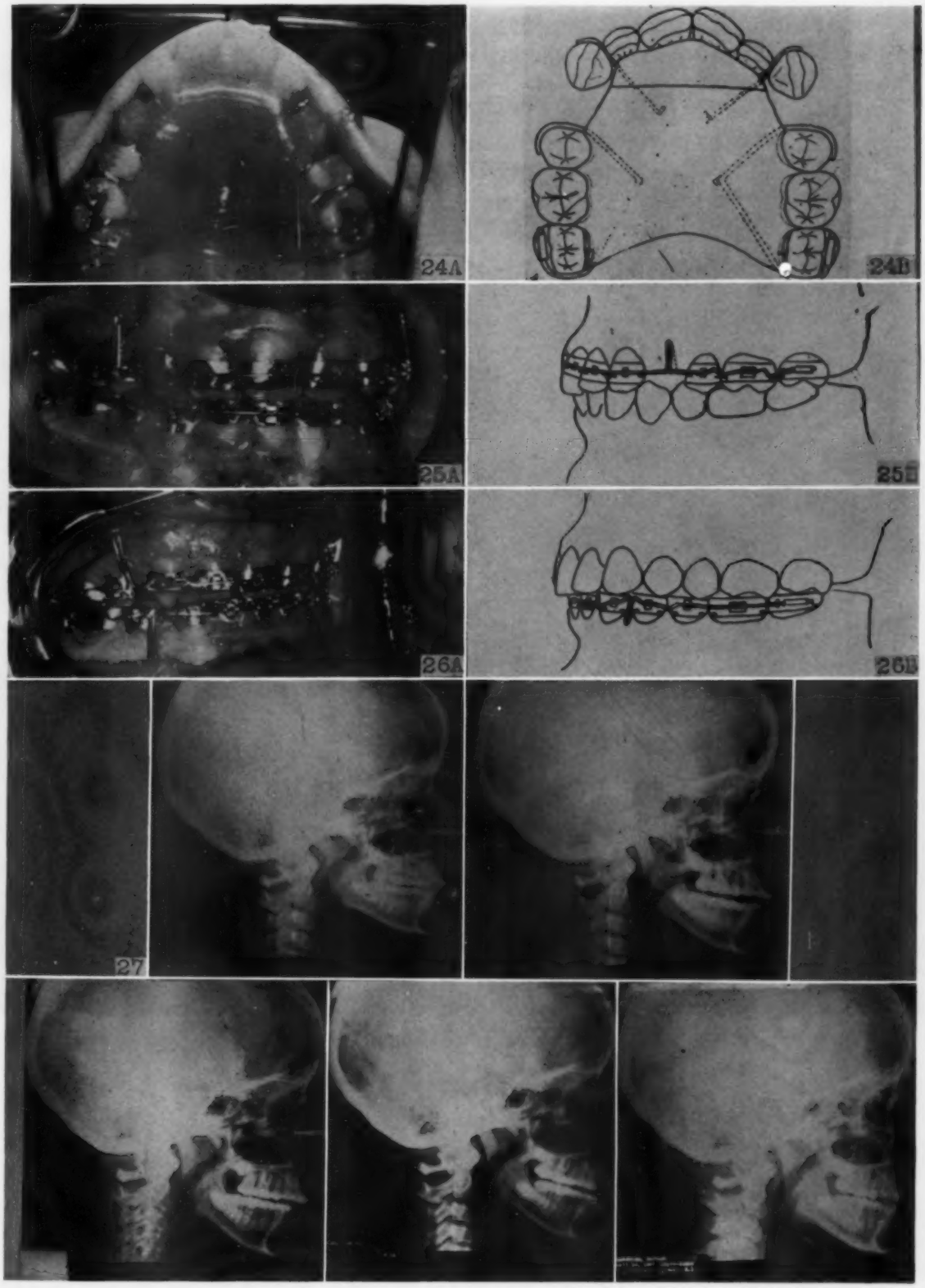
Fig. 24.—*A*, Acrylic plate with finger springs to move cuspids distally. *B*, Schematic drawing of *A*. (From Paul D. Lewis.)

Fig. 25.—*A*, Double vertical loops to close anterior spaces. *B*, Schematic drawing of *A*. When rectangular arches are used it is well to round the incisal segment.

Fig. 26.—*A*, Gabled roof arch used to parallel roots in space closure cases. *B*, Schematic drawing of *A*.

Fig. 27.—Oriented cephalometric lateral x-rays of four first premolar extraction cases showing relative tooth and jaw relations at the following stages of treatment:

1. *Upper left*, At the beginning of treatment.
2. *Upper right*, After retraction of cuspids.
3. *Lower left*, After Class III mechanics and establishment of mandibular anchorage.
4. *Lower center*, After Class II mechanics.
5. *Lower right*, After completion of case.



Figs. 24-27. *(For legends, see opposite page.)*

inch, with small tip backs in the buccal segments (Fig. 22), and tied back securely. In this procedure the anterior teeth are not banded.[7] As the cuspids go distally small coil sections are added to continue to exert force against the cuspids.

Third, cuspids are carried distally by means of short coils activated between stops on the labial of the edgewise arch and the cuspid brackets on each side in each arch (Fig. 23). The activation is continued here, too, by adding small sections of coils to continue the distal movement of the cuspids. Tip backs are also used in this arch to enhance anchorage and the arch is tied back

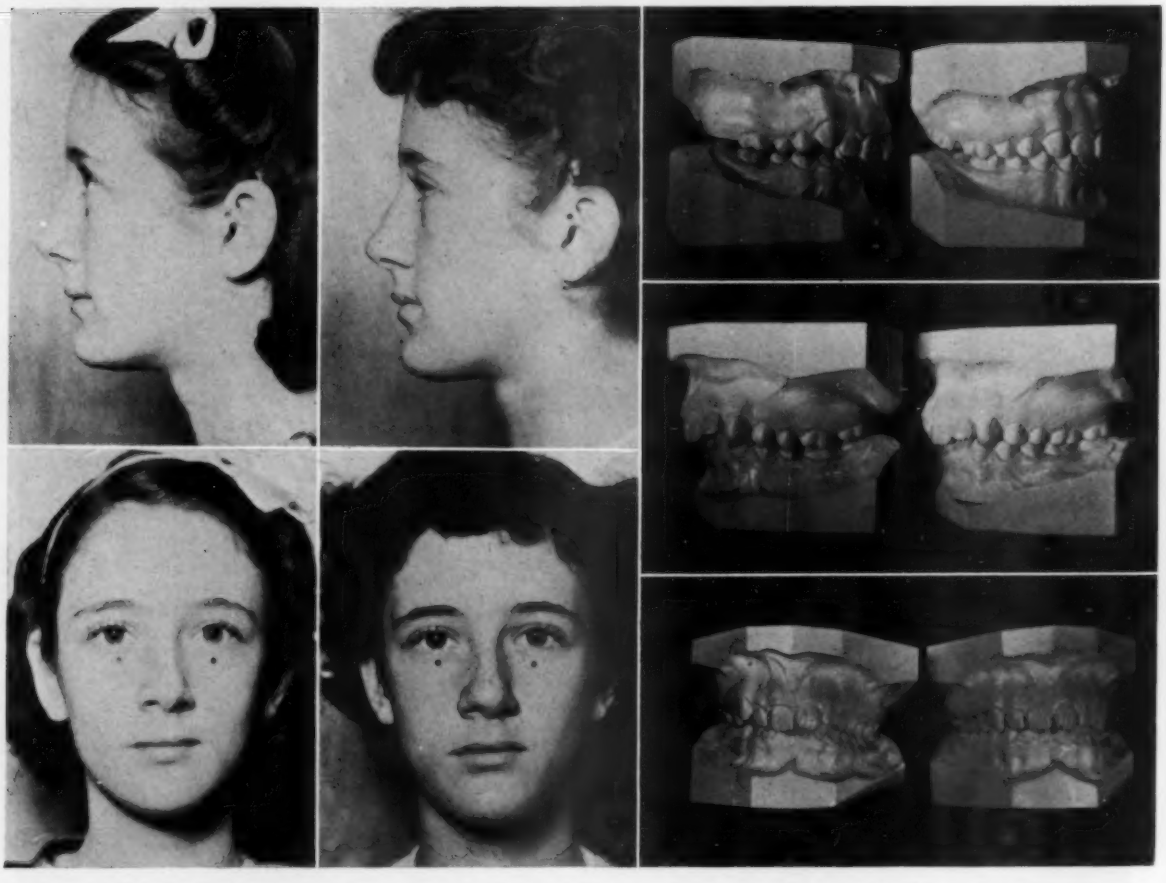


Fig. 28.—Nonextraction case, treated in accordance with methods outlined in article.

securely. The greatest advantage of this short coil technique is that extraoral anchorage or force can be added easily to help keep the buccal teeth from moving anteriorly.

Fourth, upper cuspids are moved distally by means of upper acrylic Hawley plates with finger springs fabricated to move the upper cuspids to an upright position (Fig. 24).[8] When the cuspids have been uprighted the teeth must be banded and one of the above three procedures followed through.

When the goal in the step of moving the cuspids distally is attained then all the incisor teeth are banded and full arches are placed to get bracket engagement. Full arches of 0.016 , 0.018, 0.020, 0.022 inch or 0.021 by 0.025 inch may be used in this step, followed by full arches, usually rectangular, with a vertical mashed loop on both sides just distal to the cuspids (Fig. 25). Tiebacks are placed anterior to, and away from, the buccal sheaths and hooks may be placed between the cuspid and lateral brackets to receive extraoral anchorage or force. In the buccal segment of this arch tip backs are placed.

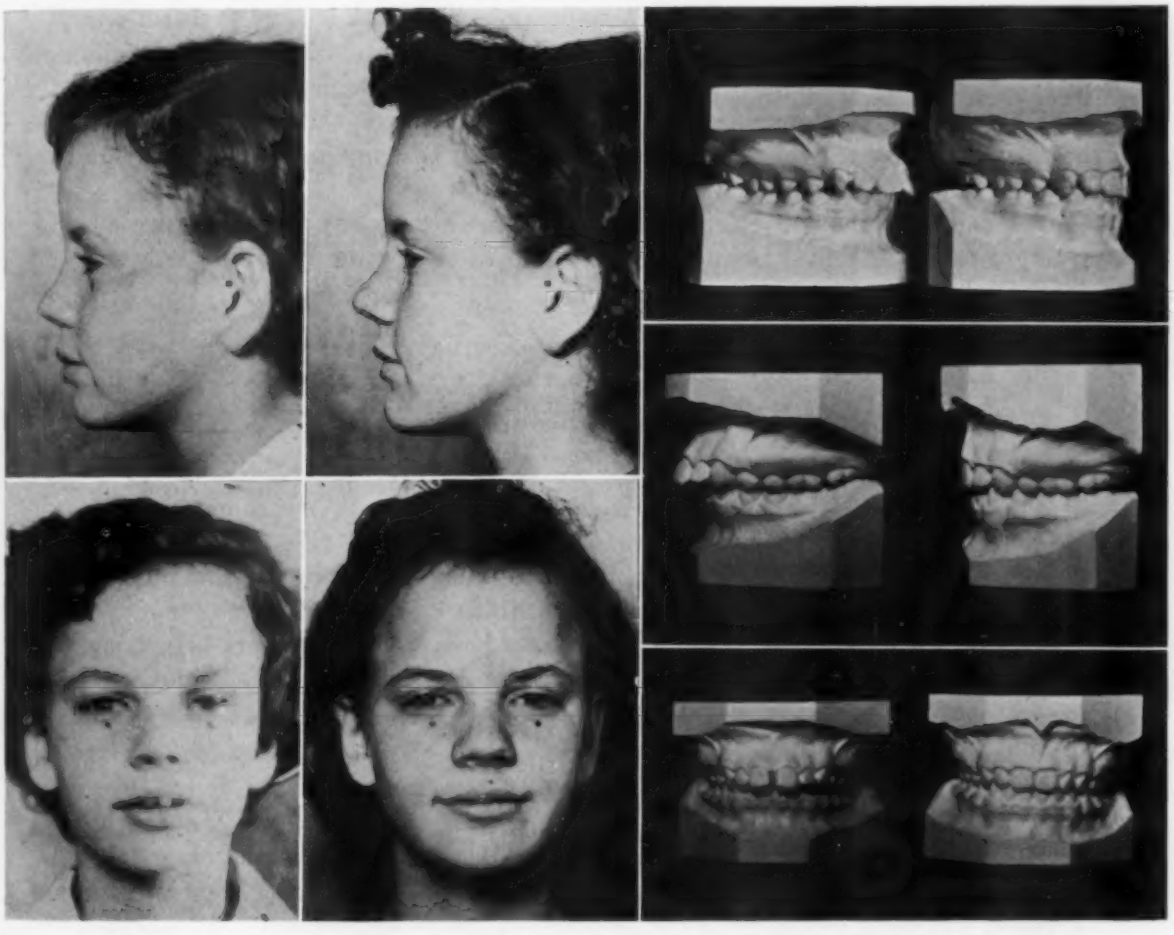


Fig. 29.—Extraction case, treated in accordance with methods outlined in article. Note upright position of lower incisors at completion of treatment. Note reduction of lip protrusion at completion of treatment.

The sequence of tying this arch in is as follows: first, the incisors and cuspids, then the tiebacks to activate the loops, and then the buccal teeth. During this time, whenever arches are tied in, consideration is given to the reduction of rotations. When all spaces are closed the case is ready for the establishment of mandibular anchorage with Class III mechanics and extraoral force on the maxillary teeth, followed by Class II mechanics, cusp seating with vertical elastics, and all other steps as used in the nonextraction cases. At times spaces

are closed in conjunction with Class III and Class II mechanics. We attempt to finish our orthodontic treatment with end-to-end incisal relationships, not knowing just where the anterior overbite should be, but knowing full well that each case will settle and the overbite will stay the same or will increase a little or a great deal. Beyond this we have little or no control over the anterior overbite. Infrequently, the anterior overbite even reduces. We are careful to eliminate rotations and correct axial inclinations as we see them. When necessary if roots are divergent adjacent to the extraction spaces, gabled roof arches, as suggested by Dr. Bull, are used to parallel these roots (Fig. 26). We try to seat our cusps rather precisely, and, above all, we try to finish our cases with the lower incisors relatively upright to base. The above details in treatment we attempt to attain because we are convinced that our cases thus finished, through our humble efforts, are at least on the road toward the best in health for all the structures involved, the best in function, the best in stability, and the best in facial esthetics.

I will now show the cephalometric lateral head x-ray records of an extraction case (four first premolars) (Fig. 27) to show the relative tooth and jaw relationships at various stages:

1. At the beginning of treatment.
2. After retraction of cuspids.
3. After Class III mechanics and establishment of mandibular anchorage.
4. After Class II mechanics.
5. After completion of case.

Two cases will be presented from among hundreds, one nonextraction (Fig. 28) and the other extraction (four first premolars) (Fig. 29) to present merely a sample of the results attainable from day to day by a great number of orthodontists who follow the Tweed teachings in orthodontics.

Again the thought is presented, as it has been by many others before me, notably, Calvin Case, George Grieve, Charles H. Tweed, L. B. Higley, and others, that our specialty is not that of the tooth straightener but rather that of the dentofacial orthopedist.

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7200 EXCHANGE AVE.

THE ORAL SURGEON'S ROLE IN MANAGEMENT OF UNERUPTED TEETH

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THE question, "Why is an oral surgeon an essayist on a program of an orthodontic society?" may be raised. This question may be answered in part by the obvious fact that both the orthodontist and the oral surgeon are concerned with the management of impacted and unerupted teeth. Conservative surgery is often a valuable adjunct to orthodontic procedures. Teeth have been sacrificed because neither the general practitioner nor the surgeon are aware of possibilities that exist relative to exposure of certain unerupted or impacted teeth. These teeth often can be conserved to become a useful dental unit. The purpose of this paper is to point out certain aspects in the surgical technique for uncovering teeth which we have found useful to the orthodontist irrespective of the type of procedure which he may elect to pursue.

DIAGNOSIS

Successful treatment of the unerupted or impacted tooth is dependent upon the proper evaluation of the roentgenographic examination. Certain important factors concerning treatment of the tooth are:

1. The surrounding anatomical structures.
2. The presence of pathological conditions related to the tooth.
3. The condition and position of the tooth or teeth.

Frequent x-ray examinations cannot be overemphasized for reviewing the position of unerupted teeth. A normal position of the tooth at one age group may later be abnormal for an older age group. The proper time for removal of deciduous teeth may be more advantageously determined by thorough x-ray examinations, rather than a hard and fast rule relative to the various age groups.

The following teeth will be discussed separately according to the technical aspects of surgical exposure:

The third molar, premolar, incisor, and canine. These teeth are treated as individual problems and create variations in technique because of the position in the jaws and varying eruption times.

THE UNERUPTED THIRD MOLAR

Third molar teeth are closely associated with the growth centers of the jaws. The consensus of opinion of the orthodontists and oral surgeons is retention of these teeth until the adult growth pattern of the face and jaws

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has been attained.[1] The logic of such reasoning certainly favors the retention of these potentially impacted teeth in spite of early roentgenographic demonstrations of malposition of these teeth in their crypts.[2]

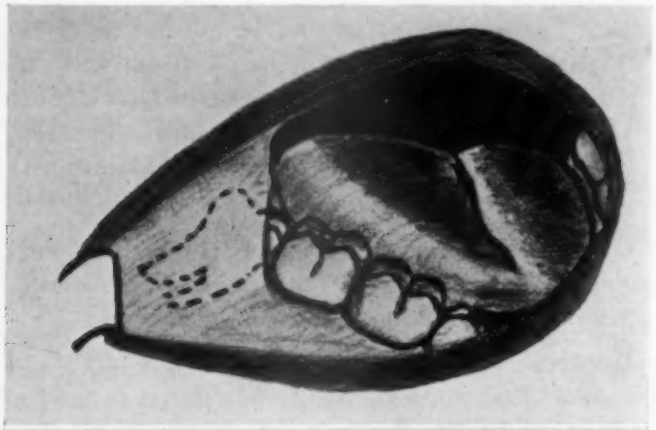
THREE FACTORS DETERMINE WHETHER THESE TEETH SHOULD BE RETAINED

1. The curve of eruption of the third molar. Space is often created as the jaw nears maturity. These teeth appear to be impacted in certain angulations of the x-rays, but later erupt with varying degrees of buccal inclination.

2. Do these teeth create a menace to the health of the oral cavity? Various pathological conditions often keep pace with the developing tooth bud.

3. Are these teeth necessary for preservation of the dental arch? These teeth are often important components of the dental arch and may be used as abutments for future restorations.[3]

Fig. 1.



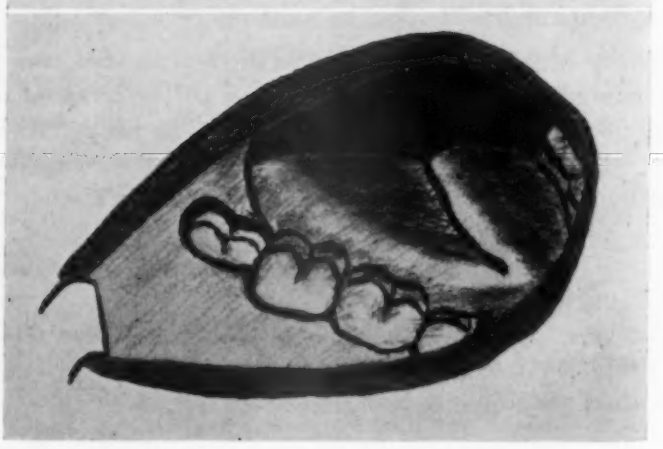


Fig. 2.

Fig. 1.—The unerupted third molar. The distal cusp covered with engorged, thickened gingival tissue.

Fig. 2.—Wide excision of the gingival tissue around the crown of the third molar. This is accomplished after acute symptoms of inflammation have subsided.

If the degree of impaction is increased by orthodontic treatment then removal of the teeth can be accomplished when facial development and the corrected occlusion have been completed.[4]

The unerupted third molars create certain subjective symptoms as they press against the overlying soft tissues. The patient has pain, local swelling, and a regional adenopathy. Gentle irrigations under the inflamed gingival flap or an incision to facilitate drainage of pus will often relieve these acute manifestations. Systemic therapy may be a useful adjunct to prevent spread of the infection. The overlying gingival tissues may be removed surgically after all acute symptoms have subsided. (Fig. 1.) This may be accomplished with the scalpel or electrosurgery. Sufficient tissue should be removed to prevent recurrence of the flap.[5] This must include all the tissues above the greatest diameter of the crown. Special attention must be given to the distal of the lower third molar. Adequate tissue removal at this point is essential (Fig. 2). The exposed crown should be covered with a nonirritating substance which permits epithelization to occur at the wound edges and relieves pain. Continued eruption of these teeth will occur if sufficient space is present.

THE UNERUPTED PREMOLAR

These teeth are usually treated shortly after normal eruption of similar teeth in the dental arch. The retention of the deciduous molar usually draws attention of the family and a dental consultation is arranged. X-ray studies may disclose an axial deviation of the crown of the second premolar or a wedging of the premolar between the first permanent molar and the first premolar. The presence of retained deciduous roots will often create an axial inclination of the crown of the premolar tooth. When the orthodontist has created the proper space for eruption of these teeth, surgical exposure can be accomplished. Preoperative x-rays must be taken prior to the surgical procedure. Occlusal and periapical x-rays will determine the position of these teeth for the surgical exposure. Successful management of the unerupted premolar depends upon:

1. Adequate exposure of the crown of the tooth to the dentoenamel junction.
2. Prevention of scar tissue formation over the operative site.
3. Correct orthodontic guidance.

After the tooth has been definitely located with regard to its position in the dental arch (Fig. 3), adequate exposure can be accomplished by sharp dissection and excision of the overlying gingival tissues. The excision must include sufficient tissues to approximate one and one-half times the size of the crown of the tooth. Bone is removed around the crown of the tooth to the dentoenamel junction on all accessible sides (Fig. 4). This is accomplished with small surgical burrs. A slot is made in the bone at least 3 mm. wide on the sides of the crown and is gradually extended to the dentoenamel junction. Small amounts of bone are removed at a time so that the periodontal fibers of the root are not damaged with the surgical burr. Judicious removal of bone on the side where movement is desired may create a surgical path of eruption. The erupting forces will usually follow the lines of least resistance and an axial inclination can be directed by such a procedure.

Successful exposure of the unerupted tooth can be accomplished only if the tissues are prevented from covering the tooth after healing occurs. Various methods have been advocated for prevention of tissue regeneration. A certain technique has been devised with the aid of a celluloid crown.[6] The purpose of this technique is to prevent growth of tissue over this area. Since there is no attachment to the crown of the tooth the only requirement is wide

Fig. 3.

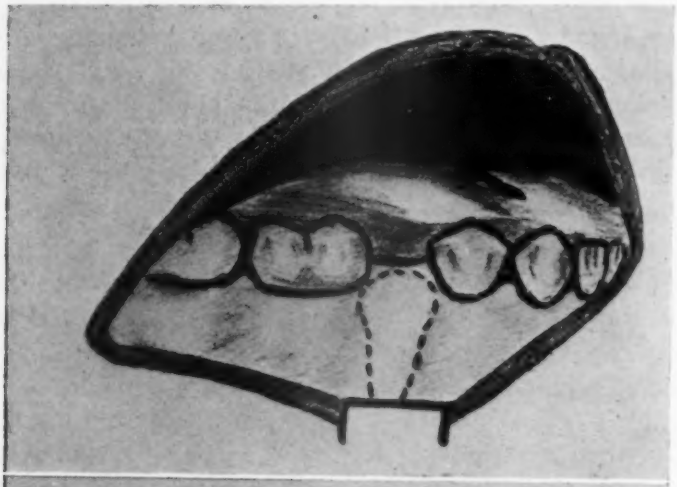


Fig. 4.

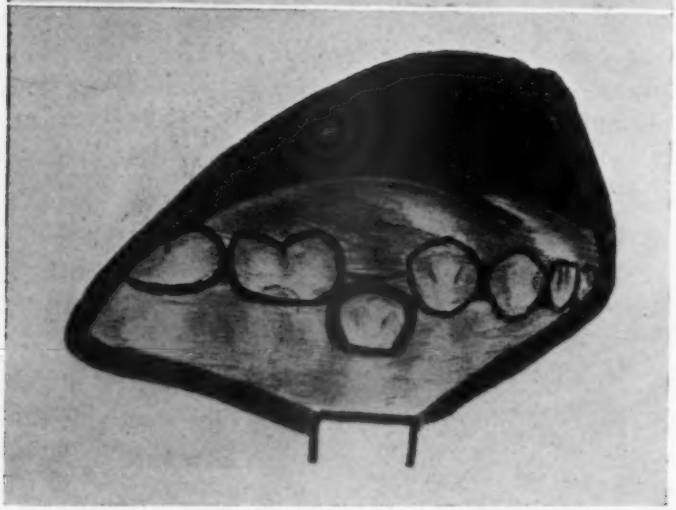


Fig. 3.—The tooth is localized with regard to its position in the dental arch.
Fig. 4.—Adequate excision of tissues to the dentoenamel junction on all accessible sides.

exposure and the normal or latent erupting force of the tooth itself for a continued eruption. Other authors have discussed the use of a gutta-percha pack[7] in the slot between the bone and the tooth. This will prevent regrowth of tissue in this area but also will lock the tooth in its exposed position. If sufficient tissues have been removed, any surgical paste is sufficient to prevent

the formation of scar tissue over the operative site. The more popular forms of dressings are pastes which harden after a few minutes. These should be left in place for one week. Covering the surgical field in this manner is advantageous because it not only prevents new tissue growth but also reduces the pain associated with areas of exposed bone in the oral cavity. It does prevent further eruption of the tooth, and until it has been removed no directed movement can be planned.

Management of these teeth is then an orthodontic problem. The shape of the crowns permits the adaption and retention of a matrix band and the movement of the tooth can be directed at the discretion of the orthodontist.

CANINES AND INCISORS

Early treatment of the malposed and unerupted incisors and canines is advantageous. The alveolar bone supporting these teeth is still in a developmental stage and is more receptive to tooth movement. Diagnosis of the position of these teeth can be determined on a clinical and roentgenographic basis.

Fig. 5.—The presence of nodules will create a diastema between the incisor teeth.

Careful examination of the oral cavity may disclose a bulging of alveolar bone or soft tissues over the crown of the tooth. Tipping of the incisor teeth from a direct or transmitted pressure of an impacted canine is not unusual. X-ray examinations are imperative regardless of the clinical impression. These disclose the relation of the unerupted tooth to the roots of the erupted teeth, the maxillary sinus, floor of the nose, nasopalatine canal, retained deciduous roots, and supernumerary teeth. While I feel that it is unnecessary to stress x-rays to an orthodontic group, we suggest that early and progressive x-ray studies are taken to determine erupting positions of teeth in the developing child.

Occlusal films orient the unerupted tooth to the regional anatomy. The Clark technique[8] for localization of the tooth in its relation with erupted teeth should be employed. Two periapical films are taken with the x-ray tube in the same vertical and horizontal angles. Before the second film is taken, the tube is shifted 2 cm. anteriorly or posteriorly. If the second film shows movement of the unerupted tooth toward the direction of the shifted x-ray tube we can assume that the tooth is lingual. If the tooth moves in an opposite direction to the shifted tube then it is displaced labially.

Fig. 6.

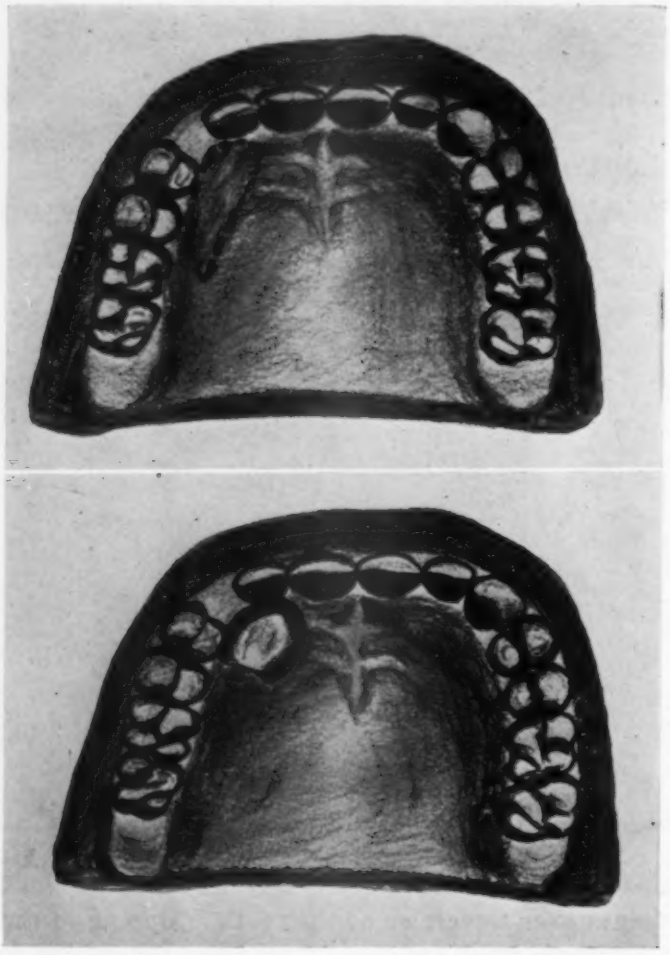


Fig. 7.

Fig. 6.—The horizontally impacted canine is frequently palatally positioned in its relation to the maxillary arch.

Fig. 7.—Movement of these teeth is successful only if wide exposure is accomplished.

Unerupted canines and incisors are often associated with anomalous tooth forms. These supernumerary teeth or nodules are often the motivating factors for malposition of the permanent teeth. Removal of these tooth forms is essential for proper eruption of the dentition. A wide diastema between two

Fig. 8.

Fig. 9.

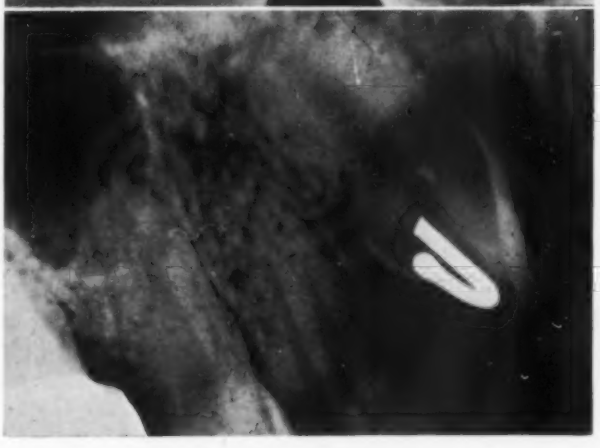


Fig. 10.

Fig. 8.—Adequate removal of bone around the crown of the tooth and at the alveolus forms a surgical path of eruption of the unerupted tooth.

Fig. 9.—A gold pin may be placed in the tooth above the cingulum to facilitate orthodontic guidance.

Fig. 10.—Roentgenogram demonstrating the direction of the pin in the dentine of the unerupted tooth.

incisors is often thought to be a result of an abnormal frenum attachment. Additional investigation by means of x-ray films may demonstrate a deciduous tooth root or a supernumerary tooth. (Fig. 5.)

The labially and lingually inclined canines and incisors present a similar problem to the premolars. Wide exposure of the tooth crown and a directed path of surgical exposure are requisites of treatment. The palatally inclined canines and incisors present a special problem. These teeth are often high in the maxilla and may be associated with anomalous tooth forms. Exposure of the permanent tooth can be accomplished at the same time as removal of the supernumerary tooth. A horizontally positioned canine should be exposed at the incisal edge, the entire inferior surface of the crown and as much of the lateral surfaces as the anatomy of the maxilla permits (Fig. 6). A semicircular wedge of tissue at least one and one-half the size of the crown of the tooth is excised (Fig. 7). A gutter is prepared in the palatal bone adjoining the lateral surfaces of the crown with small spear point surgical burrs. The lack of exposure of the superior surface of the crown and its close approximation to other teeth may preclude the possibility of a matrix or a celluloid crown (Fig. 8). A pin can be placed if either the lingual or the lateral surface is exposed. A niche is made in the enamel of the tooth above the cingulum on the lingual side or near the incisal edge on the lateral surfaces. A diamond stone is most satisfactory. An opening into the dentine is prepared with a small round burr. A small tapered fissure burr is held parallel with the tooth root and a hole 3 mm. deep is drilled. A threaded, 0.030 inch gauge, platinized gold pin is fitted. The pin should have a previously prepared hook at one end. The cavity is then dried and sterilized. A dental cement is mixed and while still very thin applied to all surfaces of the cavity. A thicker mix is placed on the clean, dry pin and this is inserted into the cavity. After the cement has hardened, the excess is removed and the wound site covered over with a surgical cement. The success of this procedure depends upon several factors:

1. Sufficient penetration of the dentine and proper direction of the slot.
2. A threaded, 0.030 inch gauge pin fitted to the channel in the tooth.
3. A sterilized, dry surface and a good dental cement.

Pulp exposure during the preparation of the cavity is an infrequent occurrence if care is taken during the slot preparation. Proper angulation of the burr and slow speeds with the dental engine are important. The pin must fit the slot or channel with some degree of proximity. Heavy pins of this caliber hold well when traction is applied. Sterility of the prepared slot will prevent occurrence of caries if the size and fit of the pin preclude the use of excessive amounts of cement. (Figs. 9 and 10.)

SUMMARY AND CONCLUSIONS

A method of diagnosis and treatment of unerupted teeth has been presented. Following the clinical examination and roentgenographic findings, the teeth have been adequately exposed for orthodontic guidance. A surgical path of eruption has been advocated to facilitate early orthodontic treatment.

A technique for the placement of a pin for palatally impacted canines has been discussed. Important factors regarding this technique include the depth and direction of slot in the tooth, the use of a heavy platinized gold pin, and a sterile, dry surface.

Conservative surgical management of unerupted teeth for future components of the dental arch is sufficiently successful to warrant its employment in all cases where there is no existing pathological condition.

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Erratum

The following footnote should have accompanied the article by Dr. Jacob B. Franklin entitled "Certain Factors of Aberration to Be Considered in Clinical Roentgenographic Cephalometry," which appeared on page 351 of the May issue of the JOURNAL:

> This thesis was submitted to the American Board of Orthodontics in partial fulfillment of the author's requirements for certification.

incisors is often thought to be a result of an abnormal frenum attachment. Additional investigation by means of x-ray films may demonstrate a deciduous tooth root or a supernumerary tooth. (Fig. 5.)

The labially and lingually inclined canines and incisors present a similar problem to the premolars. Wide exposure of the tooth crown and a directed path of surgical exposure are requisites of treatment. The palatally inclined canines and incisors present a special problem. These teeth are often high in the maxilla and may be associated with anomalous tooth forms. Exposure of the permanent tooth can be accomplished at the same time as removal of the supernumerary tooth. A horizontally positioned canine should be exposed at the incisal edge, the entire inferior surface of the crown and as much of the lateral surfaces as the anatomy of the maxilla permits (Fig. 6). A semicircular wedge of tissue at least one and one-half the size of the crown of the tooth is excised (Fig. 7). A gutter is prepared in the palatal bone adjoining the lateral surfaces of the crown with small spear point surgical burrs. The lack of exposure of the superior surface of the crown and its close approximation to other teeth may preclude the possibility of a matrix or a celluloid crown (Fig. 8). A pin can be placed if either the lingual or the lateral surface is exposed. A niche is made in the enamel of the tooth above the cingulum on the lingual side or near the incisal edge on the lateral surfaces. A diamond stone is most satisfactory. An opening into the dentine is prepared with a small round burr. A small tapered fissure burr is held parallel with the tooth root and a hole 3 mm. deep is drilled. A threaded, 0.030 inch gauge, platinized gold pin is fitted. The pin should have a previously prepared hook at one end. The cavity is then dried and sterilized. A dental cement is mixed and while still very thin applied to all surfaces of the cavity. A thicker mix is placed on the clean, dry pin and this is inserted into the cavity. After the cement has hardened, the excess is removed and the wound site covered over with a surgical cement. The success of this procedure depends upon several factors:

1. Sufficient penetration of the dentine and proper direction of the slot.
2. A threaded, 0.030 inch gauge pin fitted to the channel in the tooth.
3. A sterilized, dry surface and a good dental cement.

Pulp exposure during the preparation of the cavity is an infrequent occurrence if care is taken during the slot preparation. Proper angulation of the burr and slow speeds with the dental engine are important. The pin must fit the slot or channel with some degree of proximity. Heavy pins of this caliber hold well when traction is applied. Sterility of the prepared slot will prevent occurrence of caries if the size and fit of the pin preclude the use of excessive amounts of cement. (Figs. 9 and 10.)

SUMMARY AND CONCLUSIONS

A method of diagnosis and treatment of unerupted teeth has been presented. Following the clinical examination and roentgenographic findings, the teeth have been adequately exposed for orthodontic guidance. A surgical path of eruption has been advocated to facilitate early orthodontic treatment.

A technique for the placement of a pin for palatally impacted canines has been discussed. Important factors regarding this technique include the depth and direction of slot in the tooth, the use of a heavy platinized gold pin, and a sterile, dry surface.

Conservative surgical management of unerupted teeth for future components of the dental arch is sufficiently successful to warrant its employment in all cases where there is no existing pathological condition.

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Erratum

The following footnote should have accompanied the article by Dr. Jacob B. Franklin entitled "Certain Factors of Aberration to Be Considered in Clinical Roentgenographic Cephalometry," which appeared on page 351 of the May issue of the JOURNAL:

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OCCLUSAL EQUILIBRATION—A PART OF ORTHODONTIC TREATMENT

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IN THE last half century, life expectancy has been extended some twenty-five years in man's favor, and it now behooves us to extend this favor still further by helping him retain his teeth during this additional span of years. Man's teeth should last his lifetime and it is the duty of every dentist to keep this in mind, and strive as a healer to see that this axiom be sustained.

Man was given teeth primarily for the purpose of preserving his life. The present form of teeth and the manner in which they have been employed have been developed through evolution in the course of thousands of years. With his teeth he should properly prepare his food for normal digestion, as well as enjoy the taste that comes through thorough mastication. Biting forces[1] decrease as teeth become loose. This force also decreases when contact points are lost due to fear of pain when masticating food, as well as when a malalignment of teeth does not allow for proper occlusal relationship, and difficulty is experienced when chewing. It has also been shown[1] that as teeth are lost the patient will favor his tissues and tend to gulp rather than chew food.

All of these mentioned facts have their sequel: disturbance to the digestive tract with its many complications, and loss of one's resistance and health. The orthodontist and the periodontist have much in common. While we work differently, we both operate with, and upon, the periodontium. The orthodontist will align the teeth and bring into contact their morsal surfaces to the extent that each individual case will allow. Having thus aligned the teeth, is his work really finished? It is true that a better occlusal relationship will exist, but this relationship must be a harmonious one, one in which there is no evidence of those factors which in the years to come would give origin to periodontal disease.

Dummett[4] states "Among the factors which contribute to localized periodontitis is the malalignment of erupting teeth. It is here that orthodontic services are needed, and it is in such cases that there are produced areas of local gingivitis from improperly fitted orthodontic bands or/and orthodontic appliances in unhygienic mouths. Other periodontal involvements of childhood are seen in those cases in which, during improper orthodontic treatment, movement of the teeth is not carefully supervised and a cusp-to-cusp tooth relationship occurs. This produces a 'kinetic traumatism' which in turn is manifested clinically by tenderness, increased mobility, excessive tipping and ultimate loss of teeth."

The failure of many cases because of the presence of occlusal trauma can be avoided. This trauma will cause teeth to loosen or drift, the drifting being

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produced by a horizontal force against an inclined plane. The periodontist will take the dentition as presented and preserve the teeth by eliminating as many etiologic factors as possible, thereby encouraging the strengthening of the supporting structures. One of these factors is occlusal trauma. He will adjust these occlusal stresses to the point of tissue tolerance since he recognizes its importance. He will first determine the prognosis of the teeth to be treated. This brings up the need for a careful and complete examination, a part of which is the taking of well-exposed and processed x-ray studies. This procedure is also being followed by most orthodontists today. There have been instances in which young patients have been referred for periodontal treatment and are wearing appliances on root formations which in my estimation never warranted being used for anchorage. These teeth have either very short or conical-shaped molar roots, both of which are poor risks, or in some cases the appliances were placed on teeth in mouths having periodontal disease. We also see much evidence of periodontal disturbances in first molars where occlusal disharmony has been a most important factor. There is a preponderance of such cases.

Periodontal disturbance is not wholly an adult problem, but also one of childhood as well. The orthodontist should learn to recognize and respect this condition and check the mouths of his patients carefully before instituting treatment. In this manner he can eliminate some of his failures. Let us consider these so-called factors in occlusal disharmony which have been mentioned previously herein:

1. Formation of facets. These are worn surfaces of enamel which have lost their convexity and become flat through wear. This may occur because of the aging process or abnormal function of the teeth.

2. Food impaction. The forceful wedging of food between the teeth during mastication. This brings up the question of proper contact relationship between approximating teeth.

3. Occlusal trauma. A stress applied, usually by occlusal force, beyond that which a tooth will withstand or the alveolar process endure. This may be explained according to Box[2] as:

> 1. Primary causes, abnormal occlusal factor with normal periodontal factor, an example is cusp interference. This may be brought about in certain types of completed orthodontic cases that fail to comply with laws of balanced articulation present.[3]
>
> 2. Secondary causes. A normal occlusal factor with abnormal periodontal factor. Example, border atrophy of alveolar process.
>
> 3. Combined causes. The abnormality of periodontal and occlusal factors.

From the periodontal view, force is applied to a tooth either vertically or horizontally. It is with these forces that we are concerned.

The orthodontist by the means at his command will adjust the irregularities of tooth alignment and thus make for a better occlusal relationship. It is not enough that he obtain a good esthetic appearance of the mouth, but he should also strive to obtain a so-called harmonious occlusion, and he must check further and determine if a good functional occlusion has been established—if the proper

occlusal harmonies exist. The periodontist is concerned with the protection and health of the supporting tissues and will adjust occlusal stresses to protect these structures.

The acceptance and elimination of this condition by the orthodontist will definitely shorten the periods of retention in many cases treated. It is not the purpose of this paper to go minutely into the mechanism of the correction of occlusal factors. That would take more time than has been allotted me, but a brief résumé will be given.

As mentioned previously, facets must first be detected. These are corrected by rounding the flattened areas of the occlusal surfaces, the explanation for this being that two convex surfaces will penetrate a bolus of food more easily, less pressure being required on the part of the masticating muscles, and subsequently less strain is placed upon the supporting structures of the teeth.[5]

If both occlusal contacting surfaces cannot be made convex, strive to have one of them convex and the other flat. This will give a rounded surface against a plane or flat surface and will cut almost as well (Fig. 1), the object being

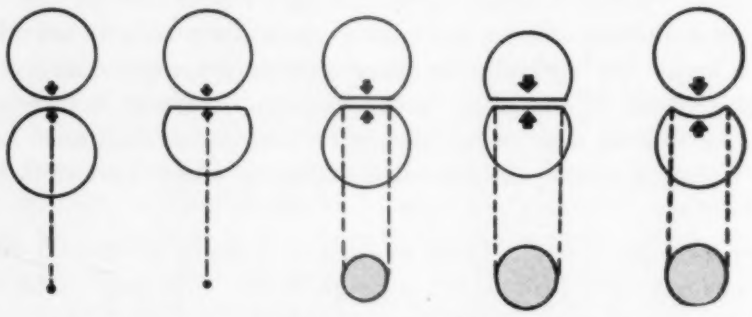

Fig. 1.—From left to right illustrates the successive amounts of force needed to penetrate bolus of food as teeth become worn and facets are formed. The extreme left represents normal convex surfaces in contact, next, a convex surface in contact with a plane or flat surface. The third and fourth represent facets with two broad surfaces and the extreme right a convex surface in a worn groove.

to make the chewing of food easier. The average person in this country is in too great a hurry to chew food properly, and if he experiences difficulty in masticating food then he will gulp it after a very few chews. Patients for whom this service has been rendered invariably will report greater ease in handling their food.

While we are more likely to observe these facets in adults we should not lose sight of the fact that they may be found in young people as well. With the tempo of daily living at its present height, youngsters acquire all kinds of biting habits and abnormally wear their teeth prematurely.

Food impaction mechanisms should be detected and corrected. Hirschfeld[5] stresses rightfully the importance of proper contact points both regarding their shape and location. These contact points must be closed and not left open to permit the beginning of periodontal breakdown. He classified food impactions on the basis of etiology into five catagories:

I. Occlusal wear.

II. Loss of proximal support.

III. Extrusion of a tooth beyond the occlusal plane.
IV. Congenital morphologic abnormalities.
V. Improperly constructed restorations.

With the exception of the last classification, "Improperly constructed restorations," which pertains primarily to prosthesis, each and all of the remaining categories must be checked carefully and their presence detected and eliminated.

Plunger cusps, because of wear or poor position, will force tooth contacts to open and food is driven gingivally. Teeth which for one reason or another have not erupted evenly and have allowed the distal portion of the crown to rise higher than the mesial usually are subjected to a force against this distal portion which will open the mesial contact and permit food to be wedged between that tooth and the one anterior to it. Another example is the vertical axis changed due to orthodontic intervention.

Loss of proximal support, either through caries or the improper closing of a space where treatment has justified the removal of a tooth, is of paramount importance. If a space cannot be properly closed through orthodontic means, then the necessary operative procedures should be instituted so that possible food impaction is avoided.

The extrusion of teeth beyond their occlusal plane must be corrected not only to prevent caries and food impaction, but also to preserve the ease of movement of the jaws in mastication.

Congenital morphologic abnormalities are well handled by the orthodontist. Teeth in torsion is one example; another is that of teeth that have been forced or locked either buccally or lingually to the arch. We also have in this category teeth which are peg-shaped, their cervical diameter being slightly larger than the occlusal. This latter condition usually needs operative intervention.

With the checking and elimination of facets and food impaction mechanisms, the next step is that of bringing harmony or equilibration to the teeth, not only in static position but also while in function. The elimination of one without the other will not allow for complete success.

Man chews his food in one of three ways, either by a vertical opening and closing of his mouth or by a slight lateral or milling action, or both. These produce stresses which are transmitted to the periodontium. If, as has been noted before, they are abnormal or greater than that which the alveolar process will sustain, this support will gradually give way or the tooth be forced from its position.

Schuyler[6] states "In the correction of occlusal disharmony we must visualize certain definite objectives:

1. To correlate centric occlusion with unstrained centric maxilla-mandibular relation.
2. To obtain the maximum distribution of occlusal stress in centric relation.
3. To retain the maxilla-mandibular opening.
4. To equilibrate the steepness of similar tooth inclines, thereby distributing eccentric occlusal stresses.

5. To establish smoothness of guiding tooth inclines.
6. To reduce the incline of guiding tooth surfaces, so that occlusal stresses may be more favorably applied to the supporting tissues.
7. To retain the sharpness of cutting cusps.
8. To increase food exits.
9. To decrease contact surfaces.

To this should be added the preservation of the tooth anatomy. The method used most generally to correct all occlusal factors is the careful reshaping of the teeth by means of stones.

The careless use or abuse of applying stones to the teeth may cause untold damage. This operation must be done with extreme care and forethought, for not only can we disocclude teeth, taking them out of function, but also subject stresses to be transmitted to other areas causing them to break down with the ultimate loss of these teeth as a result. Teeth will accept stresses that are exerted along their long axis better than those which produce a torque or lateral pressure in mastication.

Coolidge and Hine[7] give the following list of etiologic factors of occlusal trauma:

1. Malposition of teeth.
2. Cusp interference.
3. Mesial drifting or tipping.
4. Loss of supporting tissue reducing the capacity of a tooth for normal function.
5. Excessive overbite.
6. Uneven rate of tooth eruption.
7. Uneven occlusal wear.

To these may be added biting and mouth habits which have been classified by Sorrin[8] as habit neuroses, occupational habits, and miscellaneous habits. While these habits may not in themselves be classified as traumatic occlusion, yet they may so act upon a tooth as to throw it into that occlusion.

The first consideration in establishing occlusal harmony is the proper relationship in centric occlusion. Improper contact in this position may cause temporomandibular disturbance. Premature contacts must be located and eliminated. An attempt must be made to have the teeth come to rest in their proper position. For this purpose carefully prepared study models should be made from impressions taken with an alignate or similar material. Centric relation records should be obtained in wax bites so that the casts may be mounted on an articulator as near correct as possible. Premature contacts are observed on the casts and checked in the mouth. This should be done with extreme care so as to prevent possible misinterpretations produced by poor or false markings. Before any reshaping is done the patient should be observed shifting into both protrusive and eccentric positions.

The technique used and found most satisfactory in correcting disharmonies is that which was suggested by Schuyler[6] and with some minor variations will be explained very briefly below. A full discourse with its variations would be too lengthy.

Prematurities in centric that are recorded by articulating paper placed between the teeth are first examined. There are, of course, two markings, one on the upper tooth and another on the lower tooth. A study of the patient's eccentric movements is made and the area to be reshaped is that which will do the greatest amount of good without disturbing the vertical dimension. For example, if a prematurity exists between a lower buccal cusp and the fossa of an upper tooth, the patient is requested to shift the mandible to a functioning position on that side. If at that time it is observed that the buccal cusp of the lower does not make contact with the upper tooth, one would deepen the fossa of the upper tooth where and only where marked, to remove the premature contact. If, however, on going into eccentric position there is a premature contact with the upper cusp then the buccal cusp of the lower tooth would be reshaped (Fig. 2). In this manner one goes from one prematurity to the next until all have been corrected.

It has been found expedient to use two colors of articulating paper. With one color the centric contact or relationship is marked. For this purpose red is used. Blue articulating paper is used to record all functional movements of the mandible. By using the two colors in this manner one knows if the area he wishes to reshape may be adjusted and how much of it may be corrected. Those areas which have red or a combined red and blue marking must not be touched once centric relation has been established. The centric markings in red should be allowed to remain throughout the adjustment of the occlusion.

The next step is to correct protrusive position and excursion. In the former the edges of the anterior teeth are shaped up for appearance and contact with the lower teeth, the object being to have as many teeth as possible meet in this position with those of the opposing arch, all six anterior teeth if feasible. If posterior contact can be procured, so much the better, but in the vast majority of cases this will not be possible without undue mutilation of the anterior teeth, and therefore no attempt should be made to obtain it. You are now ready to proceed with the correction of protrusive excursion.

In this instance markings are obtained with articulating paper by having the patient close in protrusive position and slide the teeth back to centric position (Fig. 3). Any dysfunction that is present, and this is observed by either the eye or digital palpation, or markings, is relieved at the expense of the lingual surface of the upper anterior tooth involved. One must be careful not to touch the centric red mark, thereby causing a so-called minus or negative condition. Only the actual blue excursion mark and no other is relieved.

When all excessive pressure or dysharmony is relieved in protrusive excursion, you follow through to the lateral movements. At this time the patient is instructed to close the jaws in lateral position, articulating paper having been previously placed between the teeth on this side. The teeth are then shifted to centric position. Those teeth which are carrying an excessive load will show markings on either the buccal or lingual cusp. If it is on the buccal cusp then the relief is given at the expense of the upper tooth as this cusp plays no part in centric position. The lower buccal cusp does, and to relieve this cusp would only create a loss in centric. By similar reasoning if the lingual

Fig. 2.

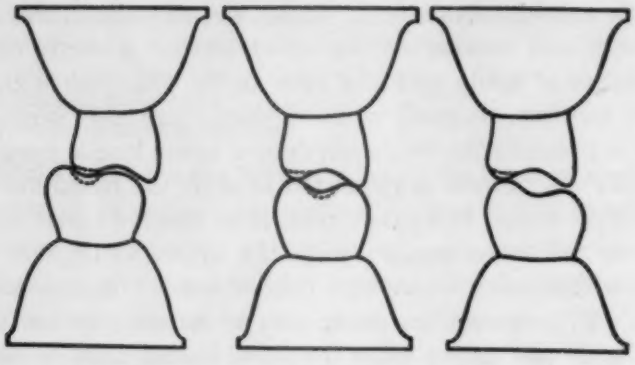

Fig. 3.

Fig. 4.

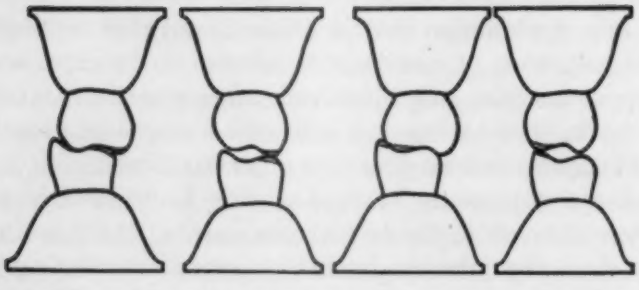

Fig. 2.—Premature contact in centric relation. Check teeth in functional relation. If contact is normal as shown in center, deepen the fossa, if traumatic as on right, shorten cusp.

Fig. 3.—Showing the correction of excessive pressure in protrusive excursion. Do not disturb the centric relation mark, but relieve pressure at the expense of the upper tooth as indicated. The articulating paper marks will indicate place to relieve. Any reshaping of the lower tooth will give a negative occlusion as illustrated.

Fig. 4.—Illustrating the reason for the relieving of the upper buccal cusp or the lower lingual cusp. These cusps play no part in maintaining the vertical dimension.

cusp is the one receiving the excessive load it is the lower lingual cusp which is shortened (Fig. 4). This process is continued until there is a distribution of stress to the greatest number of posterior teeth on that side.

Having corrected the functioning movements on one side, the opposite side is then checked and adjusted in a similar manner. It is now a good idea to check the balancing side tooth contacts. In the natural dentition we do not need contact on the afunctional side. This is required in artificial dentures only, but any interference on this side must be eliminated. With the patient shifting his teeth into a lateral functional position, check and determine if there is any interference on the opposite or balancing side during this movement. Any interference noted should be corrected.

The point that one should always keep in mind is that once centric has been corrected, any and all other reshaping of teeth must be done in such a manner as not to interfere with or change this relationship in any way. If one will observe this primary rule there will be little likelihood of getting into trouble. At the conclusion of the occlusal adjustment recheck the centric relation.

It is better to do too little reshaping than too much. Tooth structure once removed cannot be replaced. Do not attempt to obtain a so-called balanced occlusion, since it is rarely possible in the natural dentition. Strive for an equilibration or harmony, in which instance the load will have been distributed over the greatest possible area.

It is my feeling that if the orthodontist will consider these facts and make the necessary corrections it will aid him to render a far better service to his patients and will eliminate some of the heartaches he encounters.

SUMMARY

The correction of occlusal factors should be a part of orthodontic treatment.
The periods of retention will be shortened in certain cases.
Future periodontal troubles will be prevented.
Prevention is the keynote of dentistry today.

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1418 Medical Arts Bldg.

TREATMENT OF BIMAXILLARY PROTRACTION CASES WITH ONLY THE TWIN AND FLAT WIRE APPLIANCES AND ALSO IN CONJUNCTION WITH REMOVABLE ANCHORAGE

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REPORT OF A CASE

THIS patient was treated many years ago when I first became aware of the great value of the appliance therapy introduced by Dr. Joseph E. Johnson. The typical upper and lower twin wire assemblage was used except that the upper end tubes are in contact with the distal of the canine locks and are also stopped in the buccal tubes (Fig. 1). This produces good stability in the upper arch for the initial retraction of the lower anterior teeth after the extraction of the lower first premolars.

Fig. 2 illustrates a comparison of the upper and lower anterior teeth before and after retraction of the lower incisors and canines.

Lower intramaxillary elastics were then used in conjunction with Class II intermaxillary elastics after the extraction of both upper first premolars. This permitted slight forward movement of the lower molars to complete the space closures and liberate cramped lower third molars. Flat wires supplanted the twin wires for more vertical retraction and more stable mandibular anchorage.

The greatest difficulty in the treatment of this type of case is the necessity for softening up the mandibular anchorage before retracting the upper anterior teeth. Therefore, for the last eight years I have always placed one of my removable anchorages in the lower arch at this point in the treatment. This procedure I shall show later.

After completion of the retraction of the upper anterior teeth the soft tissue shows very little readaptation as yet (Fig. 3, *B*). However, the profile one year later illustrates considerable improvement (Fig. 3, *C*).

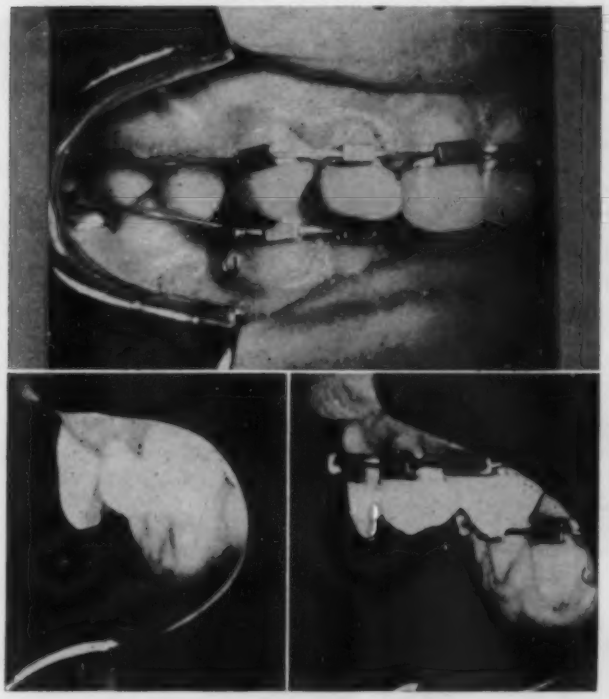
A comparison of the oral photographs one year after treatment (Fig. 4, *A*) and six years after treatment (Fig. 4, *B*), discloses the natural readjustment in the axial inclination of the teeth after the third molars have erupted (Fig. 4, *C* and *D*).

This is undoubtedly a stable articulation, six years after treatment. However, I have found it advisable for the last eight years to use upper and lower removable anchorages in conjunction with sectional arches to retract first the canines and then flat wires for the retraction of the four incisors. There is less chance of undesirable slipping of the anchorage.

I originated this appliance in 1943 and have used it constantly since. As all of us who have been practicing orthodontics for thirty years or more know,

Presented at the Fall Meeting, Northeastern Society of Orthodontists, Philadelphia, Pa., Nov. 12, 1951.

Fig. 1.



A. *B.*

Fig. 2.

Fig. 1.—The upper end tubes are in contact with the distal of the canine locks.

Fig. 2.—A comparison of the upper and lower anterior teeth before and after the retraction of the lower incisors and canines.

A. *B.* *C.*

Fig. 3.

Fig. 3.—*A*, Profile before treatment; *B*, profile immediately after treatment discloses very little soft tissue readaptation as yet; *C*, one year later, considerable improvement.

there have been too many appliances urged upon the unsuspecting orthodontist without thorough trial first. I had planned, therefore, to wait ten years before introducing it. During the last eight years I have referred several cases wearing one of these appliances to other orthodontists.

Any removable appliance involves the personal equation of the cooperation of the patient. This is the only inherent weakness of this appliance. It is, of course, absolutely requisite that the appliance be properly seated before inserting intermaxillary elastics or they can do more harm than good. There is also the possibility of loss. I have advised my patients for years to insure them for a premium of $5.00. A very few patients will tend to develop gum proliferation.

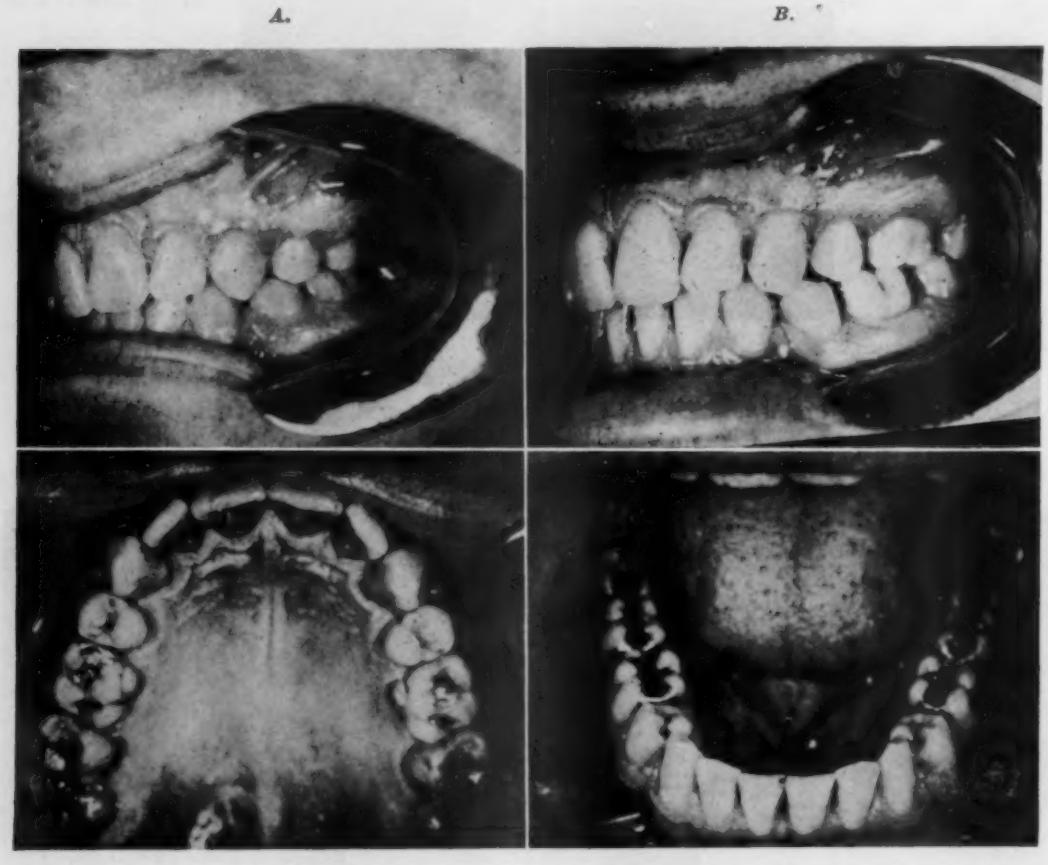


Fig. 4.—A comparison of the oral photographs one year after treatment (*A*) and six years after treatment (*B*) discloses the natural readjustment in the axial inclination of the teeth after the third molars have erupted (*C* and *D*).

These few faults are more than outweighed by the many advantages, such as complete mandibular or maxillary anchorage without any alveolar skidding that sometimes occurs despite multiple band appliances. It also eliminates the necessity for using headcaps. With a little care in patient selection I have had nearly 100 per cent success in the use of this appliance whenever indicated.

A. *B.*

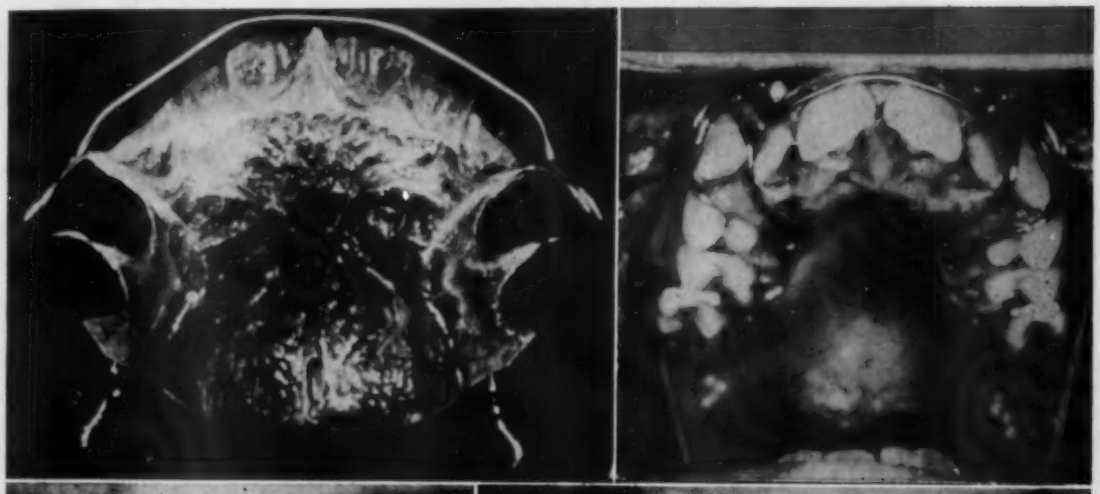


Fig. 5.

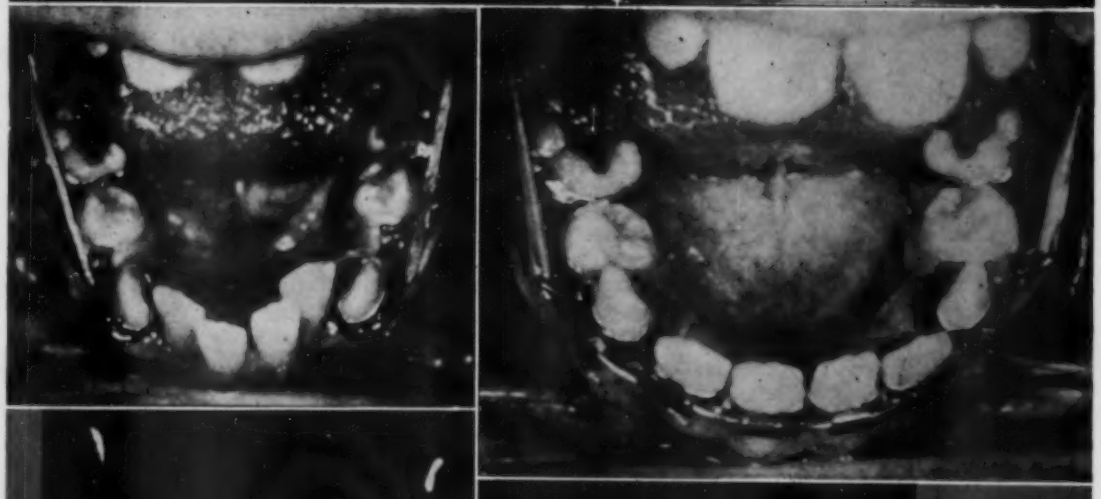


Fig. 6.

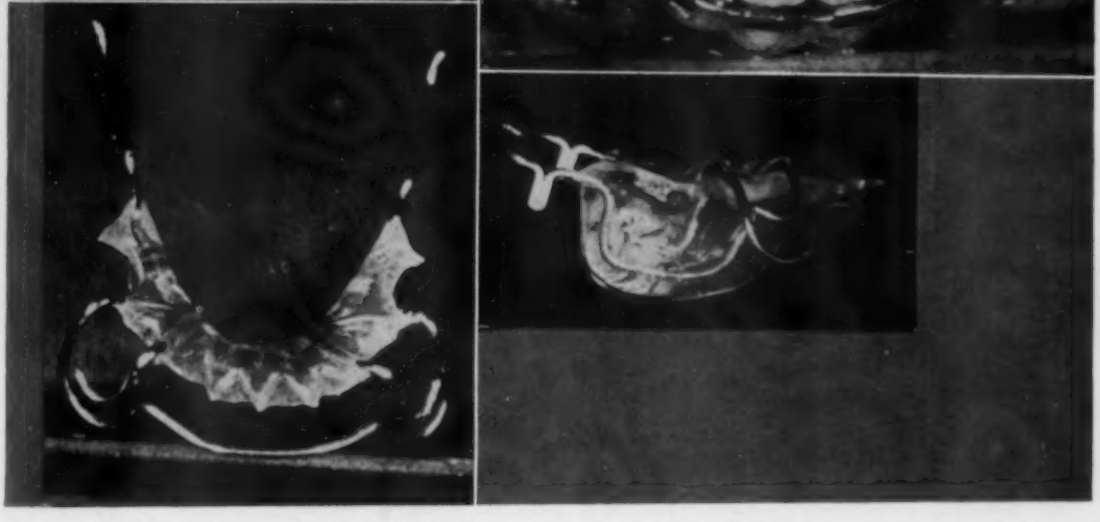


Fig. 7.

Fig. 5.—*A*, The tissue side of an upper removable anchorage; *B*, upper removable anchorage in the mouth.

Fig. 6.—*A*, Lower sectional arches with Class III elastics to retract the lower canines; *B*, flat wire arch with Class III elastics to retract the lower incisors.

Fig. 7.—*A*, A lower removable anchorage; *B*, side view of the same, showing the Ellis loops.

Fig. 5, *A* shows the tissue side of an upper removable anchorage and Fig. 5, *B* shows it in place. Unfortunately the Ellis loops that fit into the lingual tubes are not visible; however these show on the lower. I do not quibble about the accepted term anchorage. After all it is a nautical term and a boat at anchor is certainly not stationary.

Class III intermaxillary elastics are used to retract the lower canines by means of lateral arch segments. I sometimes use a lingual arch to help guide the canines distally, but frequently permit them to take their own course in the channel of cancellous bone (Fig. 6, *A*).

After the canines have been retracted I band the four incisors for retraction with a flat wire arch (Fig. 6, *B*).

The second premolars are kept ligated to the end tubes throughout, with the ligature wire passing occlusally on the mesial and gingivally on the distal. This will, as a rule, maintain them in vertical position despite the severance of the transeptal fibers to the lost first premolars.

A lower removable anchorage is now made (Fig. 7, *A*) and in Fig. 7, *B* you will note a side view of it, showing the Ellis loops which slip into the lingual tubes.

The upper first premolars are extracted, sectional arches placed with Class II elastics, and the procedure repeated in reverse.

This technique is completely sound from an engineering as well as a physiological standpoint, being a continuous problem in unequal anchorage. It utilizes the stability of the supporting structures for anchorage in conjunction with the flexibility of the Johnson appliances for the moving element. At no time does the appliance load exceed the physiologic mean.

ADDRESS BY THE CHAIRMAN OF THE NEW YORK STATE ADVISORY COMMITTEE ON ORTHODONTICS

FRANKLIN A. SQUIRES, D.D.S., WHITE PLAINS, N. Y.

THIS is a report on orthodontics in the New York State public health program. Interest in the aspects of orthodontic treatment rendered in conjunction with state departments of health has now become widespread. I have been with the program in the State of New York since its inception. It might be well to describe the original setup, how it came into being and some of the problems faced in the early days of the program; possibly, also, a description of the mechanics involved in starting such a program in other states. Who determines what is to be done? How are fees established and to whom is service rendered?

Much of what I shall report is not new and has been reported previously. For those particularly interested in the subject I would refer them to a paper by Dr. J. A. Salzmann entitled "Orthodontics as a Public Health Activity." This appeared in the March, 1949, issue of the Journal; also an article by Dr. Arthur Bushel entitled "Orthodontics—a Public Health Program," in the March, 1950, issue of the New York State Department of Health's publication.

Prior to the initiation of a specific orthodontic care program, the New York State Department of Health, through its physically handicapped children's program, had been approving requests for state aid to provide orthodontic treatment for certain children. In these cases, the malocclusion was associated with some other defect such as cleft palate, cleft lip, or some general orthopedic deformity.

However, a "physically handicapped child," according to the New York State Children's Court Act, means "a person under 21 years of age who, by reason of a physical defect or deformity, whether congenital or acquired by accident, injury or disease, is or may be expected to be totally or partially incapacitated for education or for remunerative occupation." In view of this definition, it was apparent to the department that there are malocclusions without surgical history which may reasonably be considered as constituting physical handicaps.

In 1944, Dr. Edward S. Rogers, then the Assistant Commissioner of Health for the State of New York, wrote a letter to our president requesting aid from our Society and soon thereafter a separate orthodontic care program, administered by the Bureau of Dental Health, was initiated. But before it could be set in motion, it was evident to the director of the Bureau that two major problems required solution. First, since such a high per cent of all children suffer

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from malocclusions of varying degrees of severity, it was essential that a definition for "handicapping malocclusion" be determined. Second, a decision had to be made as to what the professional requirements should be for orthodontists who wished to participate in the program.

To solve these and several other problems, Dr. David B. Ast, Director of the Bureau of Dental Health of the State of New York, appeared before our society at the March, 1944, meeting.

A committee of five members had been appointed by Dr. William Keller, who was then president, to cooperate with the New York State Department of Health. The members of this committee were: Drs. Leuman M. Waugh, Joseph D. Eby, Henry U. Barber, Jr., J. A. Salzmann, and Franklin A. Squires.

All these members were subsequently officially appointed by the Commissioner to serve as an Advisory Committee on Orthodontics to the New York State Department of Health. The Commissioner of Health of the City of New York then requested this same committee to serve in a similar capacity to his department. With the exception of Dr. Barber, whose untimely death in the summer of 1948 robbed our profession of one of its outstanding members, this committee has continued to function to the present time. Dr. Barber's place on this committee has been taken by Dr. Lowrie J. Porter.

Several years ago, a subcommittee under the direction of Drs. Walter Ellis and Clifford Glaser was appointed to function in the Buffalo area of the state, where most of the cases are treated in a clinic.

The functions of the Orthodontic Advisory Committee, as outlined by the Department, are:

1. To advise the Department concerning the classification of handicapping malocclusions, and whether or not selected patients fit into this classification.

2. To advise the Department as to training and experience necessary to qualify orthodontists for participation in the state aid program, and to advise concerning qualifications of individual applicants.

3. To advise the Department concerning an equitable fee scale for orthodontic care.

4. To review selected cases at periodic intervals and to advise the Department concerning the progress of treatment.

5. To advise the Department as to orthodontic educational programs and material for professional personnel, such as dentists, physicians, nurses, dental hygienists, and other interested health personnel.

6. To prepare instructions to orthodontists re progress of treatment, preparation of diagnostic aids, etc.

In carrying out the first of these functions, the Advisory Committee was aware that a classification of handicapping malocclusions could not be too specific or precise in view of the infinite degree of variation encountered among malocclusions and the individual variation in what constitutes a handicap. Particularly from the psychological viewpoint, a specific degree of malocclusion does not create a handicap, or the same degree of handicap in all children.

Because of these realizations, the following classifications of handicapping malocclusions was offered merely as a guide in determining the eligibility of cases for inclusion in the State Aid Program:

1. Malocclusions associated with cleft palate, harelip, or ankylosis of the temporomandibular articulation.

2. Malocclusions resulting from severe structural deformities involving growth and development of the mandible and/or maxillae:

   a. Prognathism

   b. Retrusion

   c. Micro- or macrodevelopment of the jaws.

3. Severe malocclusions resulting from disease or trauma of the mandible and/or maxillae.

4. Malocclusions resulting in disfigurement or speech defect which may present a serious obstacle to normal development, education, and employment of the patient later in life. (Where speech defect is the result of malocclusion this condition should be called to the attention of the school authorities so that the speech defect, as well as the malocclusion, may be corrected.)

Consideration was also given by the Advisory Committee to a definition of the qualifications required of a dentist to be placed on the specialists' roster. In creating such a definition, the problem was, on the one hand, to limit this roster to well-qualified orthodontists, since they were to be treating the more difficult cases; and, on the other hand, not to be so restrictive as to cause shortages of approved personnel in large sections of New York outside of the metropolitan district. It was therefore established that orthodontists devoting at least 75 per cent of their practice to this specialty were approvable if they came under one of the following categories:

1. Dentists certified by the American Board of Orthodontics or who meet its requirements for certification.

2. Active members of the American Association of Orthodontists.

3. Others not meeting the requirements of the American Board of Orthodontics or the American Association of Orthodontists must submit information in regard to their training and experience, also five treated cases for review, including case histories, diagnostic aids (study models, radiographs, photographs), and treatment models. This material is submitted to the Advisory Committee on Orthodontics for their recommendations as to the applicants' apparent knowledge and ability.

The current roster of approved specialists for the entire state includes *158* qualified orthodontists, 95 of whom practice in New York City.

HOW TREATMENT IS OBTAINED

Potential orthodontic cases may be referred to the appropriate district, county, or city health officers by any interested person including a parent, public health nurse, teacher, dentist, dental hygienist, or social worker. On the basis of this referral the local health officer authorizes a consultation by a dentist. (He need not necessarily be an orthodontist.)

The dentist is requested to examine the child and express an opinion as to whether the malocclusion presented fits into the established classification of handicapping malocclusions. If the dentist believes the case is not of such severity, he fills out the consultation form accordingly and the case is not approved.

However, if this examiner believes the case does qualify, or *may* qualify, he is instructed to submit diagnostic aids for review. These diagnostic aids include:

1. A full series of mounted dental radiographs.
2. A set of properly prepared study casts.
3. One true profile and one true full-face photograph (showing head and neck only) with mouth in rest position.

This material, together with the patient's history, is reviewed by the Dental Bureau staff. Cases which leave no doubt as to their eligibility from the viewpoint of handicapping malocclusion are accordingly approved for state aid. Those which are of borderline eligibility or which present some complicating factor are referred to the Advisory Committee for their recommendation.

The local health officer concerned is notified of the decision by the Bureau of Dental Health; and, for approved cases, he initiates the procedure for obtaining treatment.

Cost of treatment is borne by the respective counties, but for approved cases the counties are reimbursed 50 per cent of the cost through state aid funds as administered by the New York State Department of Health. In all parts of the state except in the City of New York, this procedure involves petitioning the Children's Court Judge in the county of the child's residence to approve one year's orthodontic treatment by an orthodontist whose name is included on the specialist's roster. The judge's office investigates the economic status of the child's family. On the basis of the investigation, he may issue a court order indicating that the county, with state aid, will pay for the service completely, or he may provide for some parent contribution. The maximum fee for the first year's treatment is $300 when an orthodontist provides the service in his private office, or $200 when the service is to be rendered in an approved clinic. Orthodontists are actually paid by the county in question, but the counties in turn are reimbursed 50 per cent for all expenditures approved by the State Department of Health under state aid provisions.

In New York City the court procedure is eliminated, so that authorizations to provide care are issued directly by the City Department of Health, and the city is reimbursed 50 per cent of the cost for approved cases by state aid.

Since care may reasonably extend beyond one year in many cases, approval is issued for continued care. Toward the end of a year's treatment a progress report is requested.

This report includes information on the course of treatment to date, as well as prognosis. In addition, the orthodontist submits the original study casts and new study casts indicating the current status of treatment. This material is reviewed in the same manner as are original cases and, following very much

the same procedure, continued treatment may be approved. The maximum duration of treatment is three years and the maximum fee for each of the second or third years of treatment is $200 for private orthodontists and $120 in approved clinics.

During the first ten months of the year 1951, 443 new cases had been reviewed in upstate New York, of which 235 had been approved for care and 208 disapproved.

During the first seven months of 1951, 452 new cases were reviewed in New York City, of which 171 were approved and 145 are to be recalled at a later date. The balance were disapproved.

Although this program has rapidly expanded, it is apparent from the size and nature of the problem that the preventive phase of orthodontics demands emphasis. In recognization of the need for the more widespread application of preventive principles, the Dental Bureau of the New York State Department of Health is working on a manual of preventive orthodontics for distribution to all New York State dentists in an effort to provide them with useful information as to what they may contribute toward preventing malocclusion.

It is further planned that, if funds are made available, short postgraduate courses on preventive orthodontics may be offered to New York State dentists.

MEDICAL CENTRE.

PRACTICAL CEPHALOMETRICS

L. B. Higley, B.A., D.D.S., M.S., Iowa City, Iowa

YOUR program committee in requesting that this presentation be on the subject of practical cephalometrics made a difficult task even more complicated by suggesting certain questions for which they hoped to have definite answers. While an attempt will be made to carry out this request, the answers given may prove to be inadequate for several reasons, one of which may be that I have not interpreted the questions correctly.

Possibly the most important question posed by many orthodontists is, "What will cephalometrics do for me from a practical standpoint?" Others probably have the same general idea in mind when they ask whether it is necessary for them to employ cephalometrics in order to conduct a successful orthodontic practice. The answer to the latter question is definitely "No," unless we are going to say dogmatically that all practices not equipped for cephalometrics, which would be the majority, are unsuccessful. Results judged by present-day standards indicate this is not true. Just what then does cephalometrics have to offer?

Unquestionably it is an important research tool but, for the busy practitioner, it must be considered primarily as an aid to diagnosis, treatment planning, and prognosis. For filing purposes the cephalogram is a most convenient diagnostic record and it certainly reveals more information about the dentofacial and cranial relationships than any other single diagnostic aid. To be sure, there may be experienced diagnosticians who can determine all of the structural relationships, size of parts, and other conditions of a dentofacial deformity by direct examination of the patient, although this must be very difficult when the internal architecture of the skull cannot be seen. There undoubtedly are, however, many more whose power of observation is not so keen or has not had time to be so well developed, who need every possible aid to help them to decide in just what manner a patient differs from his own or the orthodontist's idea of acceptable dentofacial relationships.

The cephalogram not only confirms conditions already suspected by the orthodontist and perhaps reveals others of which he was not aware, but also serves as a pictorial means of pointing out important facts about the deformity to the patient or parents. This is especially true if a patient's cephalogram is displayed on the viewing box together with that of an individual possessing normal dentofacial and cranial proportions and relationships. It is surprising how this visual demonstration impresses the patient and parent and how much they gain from this graphic method even though they may never before have

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seen a roentgenogram of the head. Thus the cephalogram is both convenient and revealing. Some of the structural relationships that may be seen only or best through the use of cephalograms will be discussed later.

Fig. 1.

Fig. 2.

Fig. 1.—Deficient maxillary skeletal area possibly due to pressure resulting from early locking of the mandibular incisors labial to those of the maxilla. This condition is partially obscured by the soft tissues.

Fig. 2.—Deficient ramus growth in height resulting from pressure due to rheumatoid arthritis of childhood. Pressure of maxillary sutural growth appears to have caused a bend in the mandible mesial to the gonial angle.

A. *B.* *C.*

Fig. 3.

Fig. 3.—Class II, Division 1 (Angle) dentofacial deformity. *A*, Before treatment the mandibular incisors are upright; *B*, labial inclination of mandibular incisors subsequent to treatment; *C*, relapse permitting incisors to regain most of their former upright inclination.

First, however, it might be well to discuss another question posed by your program chairman, namely, "What knowledge of etiology has been revealed by cephalometrics?" Actually this method does not reveal the etiologic factors

responsible for dentofacial deformity, but it may show indirectly how they operate, because the structural changes produced are more easily seen and localized in the cephalogram.

Consider, for example, inhibitions to facial growth resulting from pressure. The downward and forward growth of the face has been well demonstrated by Broadbent and others by tracing serial cephalograms of the same individuals from birth to adulthood. It is understood that most of the nasal and maxillary growth occurs at the sutures where these bones eventually become united with the cranial base. In orthopedic therapy[1] it has been shown that if the epiphysis of a long bone is stapled temporarily to its shaft, the resulting pressure inhibits further cartilage formation and therefore growth in length of the bone.

It may be assumed in certain incipient Class III (Angle) deformities that pressure, applied in a similar manner to the maxilla by the locking effect of the mandibular incisors closing labial to those of the maxilla, inhibits sutural growth and thus the downward and forward growth of the upper face. The cephalogram can reveal this deficiency in bone growth which otherwise might be missed because it may be obscured by the soft tissue covering. Fig. 1, for example, is the cephalogram of a 24-year-old male patient whose maxillary area is so deficient that upon closure the upper dental arch is completely within that of the mandible. Furthermore the mandible is not particularly oversized. The mandibular incisors are now considerably in front of the maxillary ones, but early in the life of this individual they may have closed just labial to the maxillary incisors, producing a locking and thus an upward and backward force upon the bones of the upper face. This pressure in turn could have slowed down or inhibited the downward and forward sutural growth of the upper face when this growth should have been most prolific. This inhibiting effect could have continued until the sutures closed, uniting the bones of the upper face to the cranium, thus eliminating the main factor of growth in this direction for this area. The mandibular condyle, however, would normally continue to grow for some years, so that, as is now evident, the mandibular incisors would be carried considerably labial to those of the maxilla.

This same inhibiting effect may be produced at the mandibular condyle if the mandible is forced to close in distal malposition by tooth interference or is held distally by some other pressure force. Incidentally, if pressures can inhibit growth, then their elimination through early treatment would appear to be of utmost importance.

The cephalogram also can best reveal the change in direction of facial skeletal growth produced partially by pressure. For example, the cephalogram of the 16-year-old boy shown in Fig. 2 illustrates what may happen to the inherited growth pattern of the mandibular body if the condylar growth is inhibited by rheumatoid arthritis of childhood while the face is growing rapidly. Although growth at the condyle was inhibited, the sutural and appositional growth of the upper face evidently continued and seemingly produced sufficient pressure on the mandible to cause the body of this bone to appear bent in the region of the mandibular notch just mesial to the gonial angle. Brodie has in his files serial cephalograms of a child who early in life had a comparatively

normal-shaped mandible evidently as the result of a good inherited pattern. However, still early but a few years later, growth at the condyle was diminished due to rheumatoid arthritis and from that time on the mandibular body gradually changed to take on the characteristic shape of a mandible in which the condyles receive undue pressure or are ankylosed.

Another question asked by your program committee is, "What happens to cases out of retention when analyzed by cephalometrics?" The answer to this is, as would be expected, that some remain approximately the same as at the completion of the retention period, some improve and others relapse. Serial cephalograms reveal and record certain changes after retention better than any other media. The case shown in Fig. 3 will serve to illustrate at least one change after retention. Some years ago this Class II, Division 1 (Angle) deformity was treated with what seemed to be a very pleasing result until the cephalogram subsequent to treatment was procured. It was found that the mandibular incisors had been tipped labially during active treatment, although supposedly every precaution was used to avoid doing so (Fig. 3, *B*). When this result was discussed in a previous paper, a prominent orthodontist pointed out that this labial tipping need not be a source of concern because after retainers were removed the incisors would revert to their former inclination. Fig. 3, *C* shows this to be true for this patient. If such relapse always occurs in the mandibular incisor area, it should be pointed out that if these teeth are jumbled before treatment and alignment has been obtained by tipping them labially onto an arc of a larger circle, then, as they relapse lingually, they will again be on an arc of a smaller circle and of necessity jumble. It is also true that if these lower incisors are depressed or intruded during treatment and later relapse into their former vertical position and the bite has not been opened, they will have to jumble. This is because they will again have to fit into the anteroposterior and transverse curvatures of the maxilla which get smaller as they approach the palate.

Let us now suppose your interest in cephalometrics has been aroused and you would like to consider further its contribution to diagnosis, treatment planning, and the determination of changes produced by treatment.

Note: This discussion was given at the meeting of the Northeastern Society of Orthodontists preliminary to the presentation of a former paper entitled "Application of Cephalometric Appraisals to Orthodontic Diagnosis and Treatment," AM. J. ORTHODONTICS **37**: 244-252, April, 1951.

REFERENCE

1. Blount, W. P., and Clarke, G. R.: Control of Bone Growth by Epiphyseal Stapling, J. Bone & Joint Surg. **31A**: 464-478, 1949.

THE PRESENT STATUS OF THE AMERICAN BOARD OF ORTHODONTICS

STEPHEN C. HOPKINS, D.D.S.,* WASHINGTON, D. C.

ORTHODONTISTS should enjoy a certain amount of satisfaction in the fact that the American Board of Orthodontics is the third oldest national certifying board. In fact, it is so old that it used to be called the American Board of Orthodont*ia*! It came into being in 1929 and was preceded by the American Board of Otolaryngology and the American Board of Ophthalmology. It was set up in much the same form as were these two Boards. As time passed, it gradually assumed characteristics, methods, and an individuality of its own. In the earlier days, in fact up to quite recently, orthodontic educational opportunities were largely nonexistent. The Board had to depend upon their knowledge of a man's character, his record, and his practical accomplishments, rather than upon such things as his educational background and his grasp of basic science. It still must do this to a large extent.

Some of you have probably been confused as to the relation of the Board with the Council on Dental Education of the American Dental Association. The remarks just made regarding the development of our Board are the key to the difficulties which were encountered before final recognition by the Council was attained. Immediately following World War II, several of the other dental specialties set up national certifying boards. These were modeled after our Board, just as we modeled ours, in the beginning, after those of the two existing medical boards. The specifications, however, were set up by the Council on Dental Education. In two categories these specifications differed from those of our Board. The first was the requirement for two academic years of postgraduate or graduate study. This requirement would have excluded most of the membership of the American Association of Orthodontists. At that time, the educational facilities for obtaining such a course did not exist. The Board felt that it was not quite ready for such a stipulation. Since that time, the Council has included as a substitute for two years' study, a preceptorship of two years. This means in our case either two calendar years of full association with a member of the American Association of Orthodontists in his office, or the prospective candidate may be carrying on his own practice in his own office with his preceptor making frequent checkups. The preceptor may or may not be a diplomate of the Board, but he should be a good, qualified teacher. Preceptorship must be set up in a definite manner under Council approval. Our educational facilities have now increased considerably so that the required postgraduate and graduate courses are more readily available. These facilities will undoubtedly be increased as time goes on. Opportunities for serving a preceptorship seem to be opening up. The other point of difference with the Council was their requirement of membership in the American Dental Association.

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*President, American Board of Orthodontics.

Since our Board had for years been certifying our good Canadian American Association of Orthodontists members, we naturally hesitated over this provision. The Council was undoubtedly justified in its stand on this point, since it had no jurisdiction over anyone who was not a member of the American Dental Association. When our Canadian members learned of our predicament, they immediately and most unselfishly accepted the Council's ruling. The Board and the Council then worked out a compromise whereby Canadians certified by our Board would receive a special certificate. At this point, it seemed ridiculous to most orthodontists that our Board should not be recognied by the Council, and especially since it seemed to indicate that the standards of our Board were lower than those of other dental specialty boards. As a matter of fact, the new requirements for membership in the American Association of Orthodontists closely parallel the requirements laid down by the Council. We, therefore, requested approval and received it, in a most cordial manner, at Atlantic City in October, 1950. The present eligibility requirements may be found on page five of our 1951-1952 "Booklet of Information" which has been mailed to all A. A. O. members. Copies of this booklet may be obtained from the Board's Secretary. The requirements are:

a. He must have been in the exclusive practice of Orthodontics for at least five years at the time of filing application.
b. In computing this five year requirement, time spent in special training in Orthodontics may be included.
c. His minimum training requirements shall include a period of study after graduation from a dental school of not less than two years in graduate or post-graduate courses, hospitals, clinics, dispensaries, preceptorship under the direction of recognized specialists, or fundamental science laboratories recognized by the Council and by the American Board of Orthodontics as competent to provide adequate training in the special field. This period of study may be pursued wholly in hospitals, clinics, dispensaries, preceptorship, or fundamental science laboratories; or it may be pursued partially in schools or preceptorships and partially in other types of institutions.
d. Teaching or a fellowship in the field of the specialty may be considered in partial fulfillment of this requirement.
e. An academic year of at least eight months of graduate or post-graduate study will be considered as equivalent to a calendar year. Sixteen months or more of continuous graduate or post-graduate study will be considered as equivalent to two calendar years.
f. Study under preceptorship is acceptable if applicant has worked in the office of a member of the American Association of Orthodontists on a continuous whole-time basis for the required period, or it may be set up with the prospective applicant carrying on his own practice.
g. Satisfactory moral and ethical standing in the dental profession.
h. Citizenship in the United States. A citizen of Canada who meets all other requirements may be eligible to receive an "affiliate certificate."
i. Graduation from a dental school accredited or otherwise recognized by the Council on Dental Education.
j. A license to practice dentistry issued by a legally constituted examining board, or other legally constituted authority, in the United States.
k. Membership in the American Dental Association or the National Dental Association, and The American Association of Orthodontists.

You will note that the Board has a certain amount of discretion in determining whether an applicant is qualified in regard to his training. We believe

this is as it should be, since each specialty board has its own problems, differing from each other, but all of them working under the general rules of the Council. It is suggested that a person planning to apply to the Board should outline his educational program and discuss this with the director of the Board located in his section.

You may be interested in learning a little about how the Board works. When a qualified member of the A. A. O. applies to our secretary, he is furnished with an application form, which is filled out and returned to the secretary. This is checked and a letter is requested from at least two sponsors, his sectional society secretary and often one or two others. The secretary then sends his name to the director located in the applicant's section and the director checks on the information again. If, at the next meeting of the Board, the application is accepted, his requirements are worked out and mailed to him by the secretary. They usually include a thesis of not less than 3,000 words, case reports, appliance technique on casts, and an oral examination. He then has almost a year to fulfill same. If he has successfully completed his requirements at the next meeting of the Board, he is certified and is so notified by the president of the Board. If he does not fiulfill his requirements, he is given the opportunity for two more years. If he does not fulfill his requirements in the three years, his application is canceled. He may, later, apply again. If the candidate fails in part or all of his requirements, he may repeat his examination within five years. At the time of writing, we had 154 applications in one category or another to process at the 1952 meeting. This does not include the new applications which have been made since the 1951 meeting. During the year, each of your seven directors reads each thesis as it is submitted, and makes a written report to the secretary. These reports are then compiled and the thesis is graded at the annual meeting. This meeting usually is scheduled for the five days and four nights immediately preceding the annual A. A. O. meeting.

There is one item which causes a great deal of worry and anxiety to the Board. This relates to the requirement that an applicant must be of "satisfactory moral and ethical standing in the dental profession." The Board feels that it cannot act as a "policing" body to make this determination in each individual case. It feels that this duty should fall upon the shoulders of the sectional society to which an applicant belongs. If an applicant is an active member in good standing of such a society and of the American Association of Orthodontists we must take the stand that he qualifies morally and ethically. The Board cannot assume a "Holier than Thou" attitude despite the vigorous objections often raised by seemingly qualified persons to applicants for certification. If these objections are valid, action should be taken by the Ethics Committee of the sectional society.

It might be useful to reiterate the aims and purposes of the Board. These purposes may also be found in our 1951-1952 "Booklet of Information." They are:

Purposes:

First. To stimulate and keep alive the spirit of research and self-improvement among students and practitioners of orthodontics.

Second. To establish the competence of specialists to practice orthodontics.

Third. To arrange, control and conduct examinations for the purpose of testing the qualifications of orthodontists and to confer certificates upon those who meet the established requirements of the board.

Certificate: (NOT A DEGREE)

The certificates granted by the Board are in no sense degrees, nor do they purport to confer upon any person any legal qualification, privilege or license to practice orthodontics, nor does the Board intend to limit the activities of any licensed dentist.

Value of Certificate:

Primarily, it will establish in the mind of the holder the assurance that he is maintaining accredited standards of competency in his practice.

Secondarily, the dental profession, the lay public and such educational or other social institutions in which the services of an orthodontist may be required, will learn to discriminate between those who have standards of fitness in the practice of orthodontics and those who have not, and will be influenced by the certificate of the American Board of Orthodontics in arriving at their conclusions.

Furthermore, the establishment of definite standards of fitness to which those anticipating specialization in orthodontics may subscribe will serve as a genuine stimulus to a desire to possess such a symbol of recognition of their ability.

In Class A hospitals and in most Departments of Health, it is now required that heads of departments be diplomates in the specialty practiced.

Lists of those holding certificates will be published by the Board each year or as often as proves financially possible.

It might be well to insert a word here about the difference between national certification and the state specialist license. Certification on a national level assures the public and the profession that a dentist is qualified to practice orthodontics. It does not protect the public from the unqualified man who proclaims that he is a specialist. In some localities, therefore, State certification may be desirable to assure this protection. There is no conflict between national specialist certification and state specialist licensure.

What about the future of the Board as a result of our recognition by the Council? We have assumed new responsibilities. We may have some years of fewer applications, due to the increased requirements. It is believed this situation will work itself out. Adjustments and interpretations under the rules of the Council will have to be made from time to time. We have certified to date 354 orthodontists. Of these some 33 are deceased. The American Association of Orthodontists now has 1,151 members. These figures represent the certification of about 28 per cent of the membership. The Northeastern Society now has 357 members. One hundred forty members of the Northeastern Society have been certified with about 15 of these deceased. This represents a certification of about 32 per cent.

The Board has been fortunate, during recent years of increased stress and responsibility, in having secretaries who, building upon the solid foundation of their predecessors, have systematized their work so that the present large volume can be handled in an efficient manner. We hope that those who have dealings with the Board will feel that we are serving well.

Editorial

The American Association of Orthodontists, at its session in St. Louis in April, directed that the following tribute to its late secretary, Dr. George R. Moore, be spread upon the minutes.—*Ed.*

George R. Moore

"The American Association of Orthodontists suffered a great loss through the untimely death of George R. Moore. His departure also will be felt keenly in the field of dental education and collateral activities. Rarely do we find incorporated in one individual such a combination of true leadership, sound judgment and zealous enthusiasm in his chosen field. In addition to these qualities, he possessed a lovable nature which endeared him to a host of friends, professional and otherwise. His devotion to his beloved profession was no greater than that to his family, in which as a husband and father he exhibited such high ideals. Those members of our Association who were privileged to come under his influence educationally or as guests in his home will always remember the whimsical charm of his smile and the warmth of his friendship and hospitality.

"The sleep from which George Moore did not awaken on April sixth, 1952, took from our Association a Secretary-Treasurer who had filled this office efficiently and well for 4 years. At the same time, the Association was thwarted in its plan to reward him with the highest honor it can bestow, for he already had been made President-Elect of the Association and would have assumed the office April 24th, 1952. But more than that, our Association has lost the influence of a great friend, the smile and attitudes of a fine professional gentleman and an exemplar of unexcelled professional attainment.

"What George R. Moore has left to the American Association of Orthodontists is the heritage of a life devoted to the highest ideals of service in his beloved profession; a record of militant participation in the development of orthodontics; the expression of a mind always seeking the truth and retaining the great qualities of tolerance and kindliness. Truly, for these gifts to those he leaves behind, we shall be forever grateful.

"The American Association of Orthodontists in session April 24th, 1952, hereby directs that this tribute to Dr. George R. Moore be spread on the minutes of the 1952 session of the American Association of Orthodontists and that a suitable copy be sent to his beloved wife and family."

B. deV.

Malpractice

ACCORDING to a current report, physicians in Britain conducted a strike within the socialized medicine setup in order to secure a raise in income. That must have struck an all-time low to morale of the traditional oath of Hippocrates. In America there is now a movement on foot to solicit funds from practicing physicians for the support of medical schools in order to help offset federal support of medical education. That reflects anxiety and changing times in the health services.

Other things are happening. Malpractice suits are rapidly on the increase and they are being brought in all branches of health services. By way of example, it is reported that during a twelve-month period in 1950 to 1951, 205 new malpractice actions were instituted against those engaged in health services in New York State alone. The fact that orthodontists, for the most part, are dealing with minors and that there is sometimes quite a divergence of opinion as to just what constitutes expert practice, from a strictly legal standpoint, at least, there are sharp responsibilities and liabilities many times underestimated or disregarded by the busy practitioner. Changing times point up such responsibilities as never before.

In most states the statutes provide that the physician and dentist must exercise the knowledge and skill which is commonly possessed and exercised by other reputable practitioners in the field in the community in which he practices. in the case of orthodontics, or, in fact, any specialty for that matter, this presents a responsibility and reflects a necessity for training and preparation for practice far in excess of the general practitioner, and far more important even than it was a decade ago.

There seems little doubt that the rapid trend of all the specialties toward certification has put specialists in the spotlight, and more and more is expected of them.

Major General George E. Armstrong pointed out that in 1945 there were only 75 medical board specialists on duty in the Army. Now there are 500 officers on active duty with the Army Medical Service who have been certified as professional specialists by American Boards. In a word, the Armed Services regard certification of specialists much more important than they did during World War II.

There is no line drawn, however, in the case of suits. It is probably unwise to create the impression in the minds of parents of patients that the doctor is trying out a new procedure, a new mechanical device of some kind, or some original ideas that are new and not too well identified in the literature or by the American Boards.

It is obviously not current knowledge that when a doctor once accepts the care of a given case, he is responsible for the completion of that case, whether or not he desires to continue. He is legally permitted to withdrawn from the case only after due notice is given to the family, and only if there is a reasonable certainty that adequate care can be otherwise secured. The family have the privilege of discharging the physician or dentist at any time they so desire, but for his protection it is wise to have this understanding verified either in writing or by witnesses, in the event such a procedure might take place.

In the case of oral surgeons who operate, it is now regarded as prudent to secure the permission of parents in writing, and if such is not possible, then consultation with other reputable persons before conducting even a minor operation is advisable.

It seems plain that in the case of orthodontic treatment there should always be routine and full-mouth x-rays, not only for diagnostic purposes but also in order to create an authentic record of pretreatment conditions.

Insurance companies who underwrite professional liability point out that a great many malpractice suits originate as a result of careless or ill-advised comment on the part of one person implying incompetency on the part of another. By implication, the toss of a head or the twitch of an eyebrow can mean that previous treatment may be denounced as grossly incompetent. It may be only one man's opinion, notwithstanding, moral confidence once shattered, is "out the window."

No doubt a good rule to follow is to keep opinions to oneself if their implications are destructive in intent, unless one is well prepared to testify as to malpractice if called upon, and feels supporting witnesses will back up such contention without any shadow of doubt.

During these times one can get an honest difference of opinions, for instance, on the question of whether or not some of a child's teeth should be extracted during the process of correcting malocclusion. Patients may get a difference of opinion on this question by the simple process of consulting two or three different practitioners in the same office building. A question might arise then as to who is right and who is wrong. Who is to answer that would still be another question.

Some suits have been started against orthodontists for return of fees on the basis of the claim of failure to get a satisfactory result. Others have been instituted as a result of the aspiration of broken bits of appliances. This all adds up to the fact that one can be sued even though he may be a highly competent certified practitioner in his specialty, and that a suit is more likely to be inspired by a careless remark by another practitioner than for any other reason alone.

The moral seems plain: He who criticizes or ridicules the work of his fellow practitioner may be called upon for documental evidence in case of any kind of a suit being started as a result of broken confidence. The welfare of the patient, particularly a minor child, will come first, and that is as it should be. In the case of orthodontics, when suits are thought to have basis for success, they usually are based on the proposition that fees should be refunded. Original records are important, and carbon copies of directions, particularly to remove teeth as a part of orthodontic treatment, should be retained as a part of the record.

One thing is certain; that is that he who has the temerity to "curbstone" and critically diagnose another's case, while under active treatment, without all the facts at hand is guessing and may be wrong. Much worse, he is rapidly breaking down professional moral confidence, the most valuable asset he inherited from those who blazed the trail ahead of him.

H. C. P.

Department of Orthodontic Abstracts and Reviews

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Occurrence of Gingivitis in Suburban Chicago School Children: By Maury Massler, D.D.S., M.S., Isaac Schour, D.D.S., M.S., PH.D., Baldev Chopra, B.D.S., L.D.S., D.D.S., M.S. *J. Periodontol.*, vol. 21, no. 3, July, 1950.

"Gingivitis is a widely distributed oral affliction. Many studies have reported on its etiology and pathogenesis. However, only a few have attempted to measure the extent and incidence of the disease in various age groups. The reason has been the lack of a uniform system of classification and examination for the assessment of gingivitis in large population groups such as the one developed for the assessment of caries in large groups."

. . . . . .

"While a number of studies have attempted to determine the extent of gingival disease in adults, very few have been concerned with this problem in children. The tendency has been to regard gingival disease as a disease of adults rather than of children. However, the groundwork for adult disease is often laid in childhood. It was deemed important to ascertain the frequency of gingivitis in normal, healthy children, as well as its extent and severity. A baseline might thus be established for comparison with groups of older ages or of different economic, geographic or nutritional status. This study was, therefore, undertaken to determine the occurrence of gingival disease in grade-school children, using the P-M-A method of indexing.

"A review of the literature cited . . . indicates that a number and variety of attempts have been made to assess gingivitis, using different methods. It also shows that the methods of assessment became refined, more objective and more quantitative as the number of studies increased.

"In the beginning, clinicians (practitioners) attempted only to distinguish between the different types of gingival disease and to present only *qualitative* diagnostic criteria which would enable them to classify (and eventually to treat) the various forms of gingival disease.

"The second era was ushered in when the clinician became interested in the public health aspects of gingival disease and made serious attempts to determine the *extent* of gingival disease among the various population groups.

"Ainsworth and Young (1925) first attempted to differentiate between children with no gingivitis and children with gingivitis. They also classified gingivitis as slight, medium and severe, but made no serious attempts to employ a quantitative method. Their classification was entirely subjective, but this fault was not corrected until 1945 when King presented his method of counting the 8 anterior gingival units. It is surprising that between 1925 and 1945 no marked improvement of Ainsworth and Young's method was presented.

"It was only very recently that King (1945), and Schour and Massler (1947) attempted to define mild, moderate and severe types of gingivitis in a more precise and objective manner. The gingiva was for the first time divided into gingival units, and the papillary gingiva, marginal gingiva and attached gingiva were clearly differentiated."

MATERIAL

"This study was based on the examination of 804 children; 381 from the Melrose Park Lutheran School and 423 from Mooseheart. The children ranged in age from 5 to 14 years and included an approximately similar distribution of boys and girls. . . . Age was considered in years as of the last birthday.

"The Mooseheart children, as a group, are undoubtedly above the average physically. Only physically normal children are admitted to the orphanage and an extensive program of 'preventive medicine,' including a selective diet, regular sleep, and regular recreation (both in and out doors), contributes to an excellent record of physical standard and health. The death record has been only one-tenth of one per cent during the last 25 years (Reymert, 1947). Dental care was well above average and, in fact, almost ideal, since there were available two full time dentists and one-part-time dentist plus a well-equipped two-chair dental office. A study of the diet of the Mooseheart child by Johnston in 1943 showed that the diet of every child was excellent and that there were more children (4 out of 21) in excellent nutritive condition than are found in the usual public school.

"The Melrose Park School is a non-residential Lutheran School for the working middle-class families. There is no dental clinic in the school, but a dentist makes regular examinations and treatments. The school claims better than average dental care for its children."

AVERAGE INCIDENCE AND GINGIVITIS EXPERIENCE

Percentage of Children Affected.—Figures show that 64.3 per cent of the 804 children examined (5 to 14 years of age) showed one or more of their gingival papillae affected by gingivitis. Thirty-five and seven-tenths per cent of the children were entirely free from gingivitis. Of the 64.3 per cent showing gingivitis, 35.9 per cent showed mild, 12.8 per cent, moderate, 9.2 per cent, severe, and 6.5 per cent, very severe gingivitis.

The percentage of children affected with gingivitis increased significantly with increasing age. It increased very rapidly from 9.1 per cent at 5 years to 69.3 per cent at 7 years. The percentage rose slowly thereafter to a peak of 80 per cent of children affected at 11 years.

Average P-M-A per Child.—The average P-M-A for the 804 children also increased with age. It was practically zero (0.16-0-0) at 5 years, but increased sharply to 8 years of age (3.1-1.2-0). After 9 years, the rise in average P-M-A was much slower but was constant and steady. Peaks in the average P-M-A could be noted at 8 years, 11 years, and 13 years of age, with the depressions at 9 years, 12 years, and 14 years of age. It is not clear whether the peaks and depressions are artifacts caused by the small numbers examined at each age.

Severity of Gingivitis.—It was shown that not only the incidence of gingivitis increased with age, but that the severity of the disease similarly increased with age.

"It was interesting to note the distribution of children according to the severity of their gingivitis. Approximately 36% showed no gingivitis at all, i.e., clinically ideal gingivae. An equal number (36%) showed a mild degree of gingivitis (one to two papillae affected), which, while not ideal, were well within the range of clinical 'normality.' Thirteen per cent of the children were classified as having a moderate amount of gingivitis (3-2-0 to 5-2-0), three to five papillae and two gingival margins being inflamed. Clinically this group cannot be considered as seriously diseased nor is it perfectly 'normal.' Fifteen per cent of the children exhibited a clinically undesirable degree of gingivitis (severe and very severe). Nine per cent showed six to eight inflamed papillae

and two or three inflamed gingival margins. Six and one-half per cent of the children had more than nine papillae and three margins affected. These figures are not inconsiderable, but the gingivitis is probably related to the process of eruption of the teeth rather than to any serious systemic factor.

"*Gingivitis and Eruption of Teeth.*—The character of the inflammation as observed clinically left us with the impression that the sharp rise in gingivitis observed at 7-8 years of age was caused primarily by the eruption of the four incisor teeth and the first permanent molars.

"The sharp rise in percentage of children affected with gingivitis and in the number of papillae and margins affected with gingivitis at 7-8 years . . . tends to support this hypothesis. The slower increase in gingivitis thereafter is probably related to the slower eruption of the bicuspid teeth and the fact that these latter teeth appear over a much longer period of time (9 to 12 years)."

SEX DIFFERENCES

Percentage Affected with Gingivitis. It was shown that there was no striking difference between the percentage of the boys and the girls affected by gingivitis. There was a slightly higher percentage of girls affected from 5 to 8 years of age, while boys showed a higher percentage affected from 9 to 14 years. The differences between boys and girls during these two age periods were tested statistically and found to be significant.

DISTRIBUTION OF GINGIVITIS IN THE ANTERIOR AND POSTERIOR SEGMENTS OF THE MOUTH

"It became fairly obvious during the course of examination that a great proportion of the gingivitis observed in any given mouth was confined, for the most part, to the ten anterior (upper and lower) gingival units. These anterior segments experienced by far the greatest attack by gingivitis. King in 1945 had suggested the examination of only the anterior gingival segments rather than the entire mouth for this reason. He did not, however, present any analysis or definite figures to justify this procedure. In view of this fact, an analysis of the distribution of gingivitis in the different segments of the mouth, especially in the anterior segments, was undertaken.

"The use of the ten anterior units as an index to the gingivitis experience of the entire mouth would be desirable for a number of reasons. First, from an epidemiologic point of view, such procedure would save considerable time in examination with the result that larger numbers of persons could be examined. Second, it is much easier to observe the anterior segments than the posterior segments, so that greater accuracy and, therefore, uniformity in observations would be attained. Third, and probably the most important, if large groups are to be compared, it is more accurate statistically to compare comparable segments of the mouth rather than the entire mouth.

"In order to compare the gingivitis experience of the anterior segments with that of the entire mouth, the data were reanalyed as if only the ten anterior gingival units had been examined. The results thus obtained were then compared with the findings of the entire mouth, already presented.

"*Percentage of Children with Gingivitis.* If the percentage of children with gingivitis is calculated from the examination of the anterior segments alone, the figures thus obtained for different age levels do not differ very markedly from the figures obtained from the examination of the entire mouth. In fact, a remarkable parallelism between the two sets of figures thus obtained exists at practically all age levels."

DISTRIBUTION OF CHILDREN SHOWING GINGIVITIS IN THE ANTERIOR AND POSTERIOR SEGMENTS OF THE MOUTH

"In order to further establish the validity of the use of the anterior segments alone as an index to the gingivitis experience of the entire mouth, it would be necessary to determine exactly how many children confine *all* their gingivitis experience to the anterior segments alone, how many children show gingivitis in the posterior segments alone and how many exhibit gingivitis in both areas or in none at all. . . .

". . . it can be seen that 35.7% of all the children have no gingivitis at all and that an equal number (37.4%) have the gingivitis confined to the anterior segments alone. *Only 4.8% show gingivitis of the posterior segments alone,* the remaining 22.1% showing gingivitis in both the anterior and posterior segments.

"If this distribution is recalculated on the basis of children affected with gingivitis, it can be seen that more than half (58.3 per cent) of the children with gingivitis confine the gingivitis to the anterior segments alone. . . . *Only 7.5% of the children with gingivitis confined that gingivitis to the posterior segments alone.* The remaining 34.2% showed gingivitis in both anterior and posterior areas.

"These figures emphasize again (and prove statistically) the validity of using the anterior segments alone as an index of gingivitis experience in the entire mouth. If only the anterior segments are examined, 92.5% of the children with gingivitis will be discovered (58.3% anterior gingivitis plus 34.2% anterior and posterior gingivitis), and only 7.5% of the children who have gingivitis confined to the posterior segments alone will be missed.

"Stated in another way, if we count all children examined including those with no gingivitis, only 4.8% of the total population will have gingivitis confined to the posterior segments. If we examine the anterior segments only, only these will be counted as gingivitis free instead of with gingivitis, an error of only 4.8 per cent. The time and effort saved by examining only the anterior segments of large groups of children more than compensate for the small error."

DISCUSSION

"This study was undertaken with two primary objectives: (1) to apply the methods of assessing gingival disease described by Schour and Massler (1948) as the P-M-A Index, to a group of normal, healthy grade-school children—and in so doing to test its value as an epidemiologic method of assessing gingival disease in children and (2) to establish a 'normal' quantitative baseline of values for the occurrence of gingivitis in school children with which other studies could be compared. The latter was a particularly sought objective since the children chosen for this baseline study were above the so-called 'average' in terms of diet and nutritional status and enjoyed better than average dental care. In other words, these children came as close to an ideally nurtured and dentally cared for group of children as we could reasonably expect to find. For these reasons, we feel that the figures obtained may in reality be considered in terms of a baseline for future studies.

"While many types of gingival diseases have been described, most of these have been classified under two major divisions—the inflammatory disease (gingivitis) and the degenerative diseases (Orban, 1947). Schour and Massler (1947) pointed out that the inflammatory changes are common in childhood while the degenerative changes become more apparent in the young adult after 25 years of age. In this study, gingivitis alone was assessed since other periodontal disorders were very rarely encountered.

"*Incidence of Gingivitis.* A comparison of our data on the percentage of children with gingivitis with those in the literature indicates that our figures compare fairly well with those obtained by Ainsworth and Young (1925) in England and Wales on children aged 2 to 14 years; middle class Indian children (average age 13.8 years) as observed by Day (1940); and English children 11 to 14 years old as analyzed by King and Franklyn (1944) and King (1945). These studies showed that approximately 40% to 70% of the children were affected by gingivitis.

"Similarly, the distribution of children into categories of mild, moderate or severe gingivitis as obtained by our method agrees fairly well with similar distributions as reported for healthy children in England and India. However, our figures do not agree at all with the figures on American children as reported by Messner et al. (1933-1934) or by Bruckner (1943) who indicate less than 10% affected. It is likely that the criteria employed in these two studies were such that inflammation of the gingiva was not classified as gingivitis unless it was relatively severe.

"*Effect of Malnutrition on the Occurrence and Severity of Gingivitis.* The studies by Day (1940, 1944) and Day and Shourie (1947) in India; King and Franklyn (1944) and King (1945) in England; and by Schour and Massler (1947) in Italy all indicate that the occurrence and severity of gingivitis tends to increase with an increase in malnutrition. This is indirectly supported by the findings in this study of a lower prevalence rate and lower severity of gingivitis in this well-nourished group than in the malnourished groups reported by the above authors. However, a specific study of occurrence of gingivitis using the P-M-A index on a group of malnourished children should be done for statistical accuracy.

"*Age Incidence.* Our study showed that the percentage of children affected with gingivitis increased with increasing age. It increased rapidly from 5 and 7 years (from 10% to 70% affected). Thereafter it plateaued but remained high, up to the age of 14 years (65% affected). Similar trends were observed by Ainsworth and Young (1925), Messner et al. (1933-1934), Day (1940) and Schour and Massler (1947). The increase was found not only in the number of children affected, but also in the severity of gingivitis. . . .

"It was indicated by Schour and Massler (1947) that for the most part inflammatory lesions of the gingiva tend to affect first the gingival papilla. From the papilla the inflammatory lesions spread to the marginal gingiva. In other words, the severity of the disease has increased with the involvement of marginal gingiva. If the inflammation becomes more severe, it progresses towards and involves the attached gingiva. This study confirms that observation.

"*Eruption Gingivitis.* In our examination the clinical signs of gingival disease were recorded around both the erupting and fully erupted tooth. It was observed that the character of the gingivitis was different in the group 5 and 7 years of age from that at other age levels. During this age period of 5 to 7 years, a large number of teeth are erupting into the oral cavity. The sharp rise in gingivitis left us with the impression that it was caused primarily by the eruption of the four incisors and the first permanent molars. The percentage of children affected remained high until the age of 8 years, and thereafter dropped slightly at the age of 9 years. A quiet period, when few teeth are erupting, occurs between 8 and 9 years. Beginning with the ninth year another rise is seen in the occurrence of gingivitis. The increase was slower and was probably related to the slower eruption of the bicuspid teeth. The occurrence of gingivitis remained high from 10 to 12 years of age probably because the bicuspids erupt over a longer period of time. From the above considerations, we feel that the inflammation during this age period may be regarded as 'Eruption Gingivitis.'

"*Sex Difference in the Incidence of Gingivitis.* While there were significant differences between the gingivitis experience in boys and in girls, such differences were not very striking, nor consistent.

"In the age group from 5 to 8 years, girls in general showed a higher percentage affected by gingivitis than did the boys. The difference might well be explained on the basis of an earlier eruption of teeth in girls.

"From 9 to 10 years of age no differences in gingivitis experience could be determined in boys and girls. However, from 10 to 14 years of age, there was a tendency for boys to show more gingivitis than girls. This might be explained on the basis of better oral hygiene in girls. Girls tend to become more conscious of cleanliness as they approach puberty than do boys.

"*Validity of Examining the Anterior Segments Only.* An attempt was made to establish the validity of the use of the anterior segments alone as an index to the gingivitis experience of the entire mouth. In order to test this hypothesis, different segments of the mouth were analyzed separately. It was observed that if only the anterior segments were examined and recorded, approximately 92% of the children with gingivitis would be detected, and approximately 82% to 85% of the total number of papillary and marginal gingivae affected by inflammation would be recorded.

"It is clear that for purposes of comparison between large groups, examination of the anterior segments alone is adequate. The time saved would allow the profitable examination of much larger numbers of persons."

News and Notes

Attention of Those Examined by the A. B. O. in St. Louis

Someone left behind an upper cast of a patient described as "P. Johnson." This cast is in the possession of the Secretary of the Board.

American Board of Orthodontics

The next meeting of the American Board of Orthodontics will be held at the Baker Hotel, Dallas, Texas, April 22 to April 26, 1953. Orthodontists who desire to be certified by the Board may obtain application blanks from the Secretary, Dr. C. Edward Martinek, 661 Fisher Bldg., Detroit 2, Mich. To be considered at the Dallas meeting, all applications must be filed before March 1, 1953.

Central Section of the American Association of Orthodontists

The 1952 meeting of the Central Section of the American Association of Orthodontists will be held Oct. 13 and 14, 1952, at the Fontenelle Hotel in Omaha, Neb.

Northeastern Society of Orthodontists

The next meeting of the Northeastern Society of Orthodontists will be held at the Mount Royal Hotel, Montreal, Canada, on Monday and Tuesday, Nov. 10 and 11, 1952.

Middle Atlantic Society of Orthodontists

The Middle Atlantic Society of Orthodontists met on May 19, 1952, at the Warwick Hotel, Philadelphia. This was the first regular meeting for this newest sectional component, although an organizational meeting was held in November, 1951.

Leuman M. Waugh keynoted the occasion in his usual inimitable style with an informal presentation entitled "Some Biologic Fundamentals of Importance in Orthodontics." A lively discussion followed. It is planned to include such discussion periods in all programs as a definite feature which long has been missing in orthodontic association procedures. Dr. Waugh's thoughts on biologic concepts were followed by an intensely interesting practical talk (also informal) by Joseph E. Johnson, the sage of Louisville. Joe particularly emphasized the construction and the use of his tubular lingual appliance. Numerous double lantern illustrations demonstrated the usefulness of this ingenious gadget. Discussions followed.

At luncheon the members and guests enjoyed the presence of Dean Timmons of Temple University, Dr. Looby, President of the Philadelphia Dental Society, George Callaway, President of the Northeastern Society of Orthodontists, and received a message from Brooks Bell, President of the American Association of Orthodontists.

The afternoon was devoted to a business session which included approval of the constitution. Joining the society were one associate and eleven active members. The total membership to date numbers 84, including 74 active, 2 associate, and 8 affiliated.

Plans are being made for the next meeting which is scheduled to be held at the Traymore, Atlantic City, on Oct. 20 and 21, 1952.

S. C. H.

Denver Summer Seminar for Advanced Study of Orthodontics

The Denver Summer Seminar will be held this year at the Park Lane Hotel, Denver, Colo., Aug. 3 through 8, 1952.

Spencer R. Atkinson Is Honored

"The Ketcham Award Committee of the American Association of Orthodontists announce that Dr. Spencer R. Atkinson, of Pasadena, California, was unanimously selected to be the recipient of the Albert H. Ketcham Memorial Award. He will receive this Award at the next meeting of the American Association of Orthodontists to be held in Dallas, Texas, April 26-30, 1953."

Graduate Study and Fellowships Available at the University of Minnesota

Graduate study programs leading to the degree of Master of Science in Dentistry may be arranged with a major in orthodontics, oral pathology, oral surgery, oral medicine, periodontia, or restorative dentistry (operative, prosthetics, pedodontia, or endodontics), and a minor in one of the fundamental health sciences.

Persons interested in the graduate program may obtain an information bulletin and application form from the Dean of the Graduate School, University of Minnesota, Minneapolis.

University of Washington School of Dentistry

The University of Washington School of Dentistry offers a course on the subject of occlusal dynamics and equilibration from July 7 to 11, 1952.

Further information may be obtained from the Director of Postgraduate Dental Education, School of Dentistry, University of Washington, Seattle 5, Wash.

A course in practical cephalometrics will be given at the University of Washington School of Dentistry, Aug. 20-22, 1952, announced by the Director of Postgraduate Dental Education.

American Dental Association

A number of new features, including a merger of all scientific sections for special discussions on the use of antibiotics in dentistry and on oral focal infection, will be presented at the ninety-third annual session of the American Dental Association to be held Sept. 8 through 11, 1952, at St. Louis.

Advance reservations indicate a large attendance at the four-day meeting in the "queen city of the Mississippi Valley," according to Dr. Henry F. Westhoff, of St. Louis, chairman of the committee on local arrangements.

Cooperating with the Association to make certain that all convention visitors are adequately housed are 25 of the city's leading hotels. Hotel reservations may be obtained by filling out the application form in *The Journal of the American Dental Association* and mailing it to the A.D.A. Housing Bureau, 911 Locust St., Room 406, St. Louis 1, Mo.

The official hotels will be the Jefferson and the Statler; sessions of the Board of Trustees and the House of Delegates will be at the Jefferson.

The scientific portion of the meeting will be presented at Kiel Auditorium, within walking distance of downtown hotels.

As an innovation at the 1952 meeting, all 11 scientific sections will be combined for panel sessions on antibiotics and focal infection on Wednesday morning, September 10.

Presiding at the antibiotics session will be Dr. Harry Lyons, Dean of the School of Dentistry, Medical College of Virginia, Richmond. An evaluation of the drugs' use will be presented by Dr. Robert J. Glaser, of the School of Medicine, Washington University, St. Louis, Dr. Jack B. Caldwell, of Walter Reed Hospital, Washington, D. C., and Dr. Floyd D. Ostrander, School of Dentistry, University of Michigan, Ann Arbor.

Chairman of the focal infection panel will be Dr. Lester W. Burket, Dean of the School of Dentistry, University of Pennsylvania, Philadelphia, who will present Dr. Kenneth A. Easlick, of the School of Dentistry, University of Michigan, Dr. William E. Wellman, of the Mayo Foundation, Rochester, Minn., and Dr. James R. Cameron, of the School of Dentistry, Temple University, Philadelphia.

In addition to the combined panel sessions, every phase of dentistry will be discussed by some 60 essayists at the 11 separate scientific sections to be conducted all day Tuesday, September 9, Wednesday afternoon, and Thursday morning.

Color television clinics for the 1952 meeting will be shown all day Monday, September 8, the opening day of the meeting, and on Tuesday morning. A number of technical improvements will be in use to make for increased illumination and clear pictures of dental operations.

The television clinics will originate in a specially constructed dental office on the fourth floor of Kiel Auditorium and will be shown on 10 receiving sets two floors below in the building's Convention Hall. Chairman of the television subcommittee is Dr. William S. Brandhorst, of the School of Dentistry, Washington University, St. Louis.

There will also be a continuous program of the latest scientific films assembled in connection with the A.D.A.'s newly established film library. Additionally, the scientific program will include 200 table clinics and 50 scientific exhibits. The auditorium will also house nearly 250 commercial exhibits.

Hotel assignments have been made for a number of allied and associated groups holding meetings prior to the annual session. Among these are the American Academy of the History of Dentistry, at the Hotel Jefferson; American Academy of Periodontology, Hotel Statler; American Association of Dental Editors, Hotel Jefferson; American Association of Dental Examiners, Hotel Lennox; American Association of Dental Schools, Hotel Statler; American Association of Public Health Dentists, Hotel Lennox, and American College of Dentists, Hotel Statler.

Others are the American Dental Assistants Association, Sheraton Hotel; American Dental Hygienists Association, DeSoto Hotel; American Denture Society, Sheraton Hotel; American Society of Dentistry for Children, Hotel Melbourne; Association of American Women Dentists, Mark Twain Hotel; International College of Dentists, Hotel Statler; National Association of Seventh Day Adventist Dentists, DeSoto Hotel; Alpha Omega, Hotel Statler; Delta Sigma Delta, Chase Hotel; Psi Omega, DeSoto Hotel, and Xi Psi Phi, Mark Twain Hotel.

The local arrangements committee, in addition to Dr. Westhoff as general chairman, is headed by two vice-chairmen. They are Dr. Romie H. Miller and Dr. O. F. Steber. The secretary of the committee is Dr. David W. Brock and the treasurer is Dr. Max Kornfeld.

The honorary chairmen are Dr. Oren A. Oliver, of Nashville, past-president of the Association; Dr. Robert P. Thomas, of Louisville, Sixth District trustee; Dr. Roy J. Rinehart, of Kansas City Mo.; Dr. Otto J. Fruth, of St. Louis, and Dr. H. C. Pollock, of St. Louis.

Members appointed as chairmen and vice-chairmen of committees and all of St. Louis unless others noted are Dr. Frank A. Strake and Dr. Arthur F. Schopper, of Kansas City, Mo., reception; Dr. George A. Clipner and Dr. Joseph V. Kirby, of Clayton, Mo., information; Dr. Paul G. Vierheller and Dr. Earl J. Poe, entertainment; Dr. Alva N. Blaney and Dr. Ralph Rosen, publicity; Dr. Frank W. Jaeger, convention hall, and Mrs. Earl C. Bean, of Ladue, Mo., and Mrs. Earl E. Shepard, women's entertainment.

Seminar for the Study and Practice of Dental Medicine

Two hundred dentists, including top dental-medical researchers, will be in attendance at the Ninth Annual Seminar for the Study and Practice of Dental Medicine set for the Desert Inn, Palm Springs, Calif., Oct. 26 through Oct. 30, 1952.

Advance registration, according to an announcement by Dr. Hermann Becks, President and Founder of the Seminar, indicates a capacity turnout for the five-day study session.

Notes of Interest

Dr. Robert H. Cohen, orthodontist, wishes to announce the removal of his offices to 5153 Coolbrook Ave. (at Queen Mary Road), Montreal, Quebec, Canada, practice limited to orthodontics.

Sidney L. Horowitz, D.D.S., announces the opening of his office for the exclusive practice of orthodontics at 135 Main St., Nyack, N. Y.

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THE AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS is composed of a representative of each one of the component societies of the American Association of Orthodontists.

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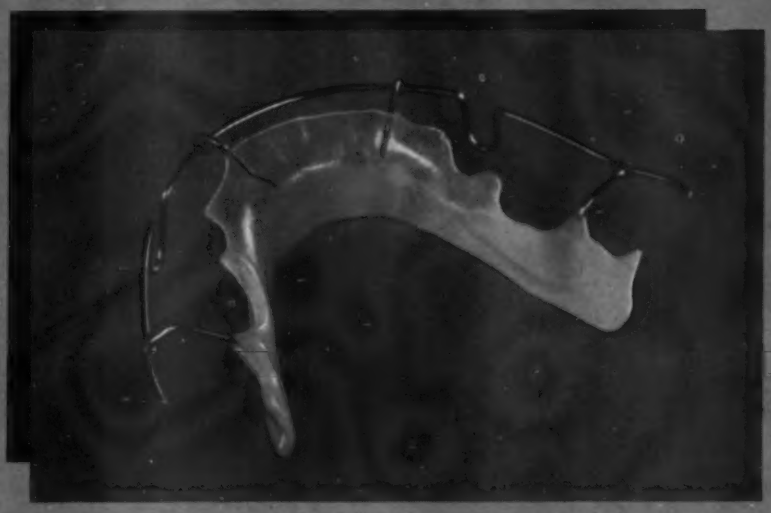

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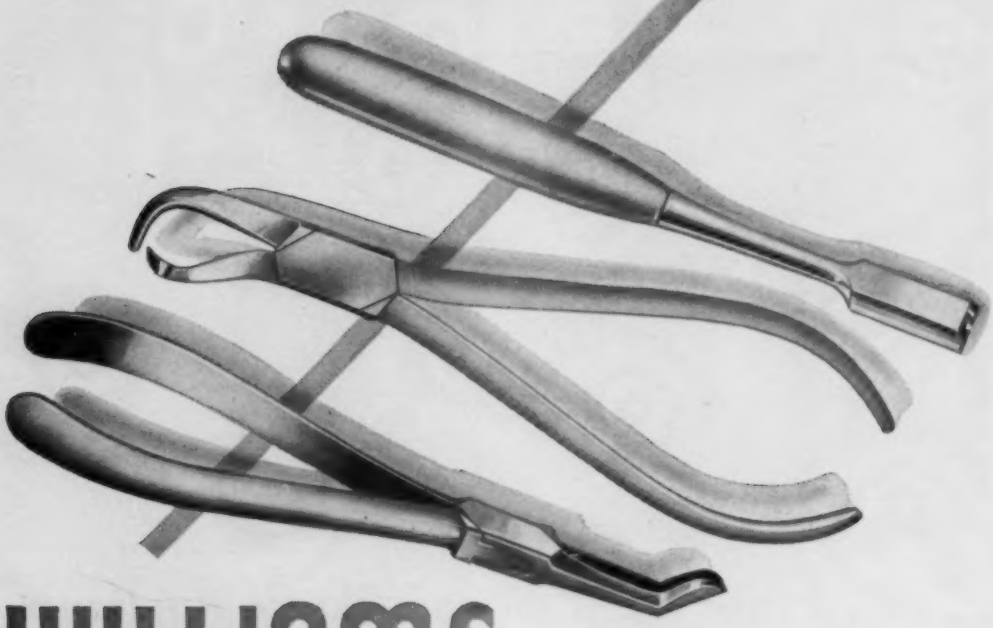

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